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MEDICINE AND THE MEDICAL AGE

A Monthly Journal of Practical Therapeutics

Edited by

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ORIGINAL COMMUNICATIONS.

GONORRHEA AS A COMPLICATION OF PREGNANCY AND LABOR.[1]

BY EDWARD A. SCHUMANN, M.D.,

Lecturer on Obstetrics in the Jefferson Medical College, Philadelphia, Pa.

The subject under discussion is the management of pregnancy and labor complicated by the association of a gonorrheal infection, and conversely, the treatment of gonorrhea in the presence of pregnancy.

Nowhere in the domain of obstetrics is there a combination more productive of material morbidity and permanent impairment of health, together with fetal injury in the form of ophthalmia neonatorum. Furthermore, even if these direct and serious lesions be prevented or relieved, there remains the great risk of the development of the so-called one-child sterility in this connection.

The first question that usually arises when a married woman has been under treatment for gonorrhea is when she may safely attempt pregnancy. While it is true that pregnancy is never absolutely safe while an infective agent remains within the genital tract, still as a general rule I have found the following plan workable and satisfactory:

Reproduction may be undertaken by a gonorrheic woman when three smears taken from the vagina and cervix—one in the intermenstrual period, one on the day following cessation of the menstrual flow, and one five days later—are negative for gonococci.

Gonorrhea and pregnancy may be coexistent under three conditions:

1. The gonorrheal infection may antedate the occurrence of impregnation.

2. The gonorrhea may have been acquired at the same coitus which resulted in conception.

3. The gonorrhea may have been acquired after conception has occurred.

In the cases belonging to the first group, and including by far the greater number, the infection has passed its acute stage and is chronic, the organisms being limited to the deep tissues of the cervix, Bartholin's glands, and possibly the endometrium and the Fallopian tubes; and treatment must be instituted with such locations in mind. The latter two groups of cases contain the acute and subacute forms of the disease, and here treatment, to be effective, must follow a different plan.

The diagnosis of gonorrhea in pregnancy is usually easy. In the great majority of cases, when the disease has been recognized preëxistent to the pregnancy, a history will be volunteered in the interests of the child. In all cases the advent of pregnancy is attended by a leucorrhea more or less profuse. The discharge varies from white to greenish-brown in color, may or may not be offensive, and on microscopic examination presents the characteristic gonococci in varying numbers. If the infection be acute and severe there will be a marked congestion of the vagina with burning pain, and even occasionally some exfoliation of the vaginal mucous membrane, with serous discharge or slight bleeding.

Sometimes the urethral infection is rekindled by the congestion about the pelvic

[1] Read before the Philadelphia County Medical Society.

tissues with purulent discharge from the meatus and painful and frequent micturition. If the internal genitalia have been involved there may develop a mild pelvic peritonitis of low-grade type. In most of the cases, however, the chief symptom is the profuse and intractable leucorrhea.

The termination of pregnancy complicated by gonorrhea is usually delivery at term, although if the infection be violent and acute, abortion may occur as a result of the intense pelvic congestion. Furthermore, if there be an associated endometritis, malformations of the fetus may take place as a result of faulty implantation of the ovum.

The principal danger arises during the puerperium, the gonococcus being the most common causal agent for producing pelvic infection during this period. Pure gonorrheal puerperal sepsis is, I believe, uncommon, but if the infection become mixed, the streptococcus, staphylococcus, or colon bacillus, being superimposed upon the original gonorrhea, serious lesions of the pelvic tissues almost invariably follow.

The treatment of gonorrhea during gestation naturally falls into the management of the condition during pregnancy, and the conduct of labor and the puerperium.

During pregnancy the local treatment should follow the general line of gonorrhea therapy, with the exception that large douches or vaginal tampons should not be employed.

If the disease be acute and present itself as a violent inflammation of the vaginal mucosa and the cervix uteri, frequent applications of a fairly strong silver solution are indicated. A good practice is to thoroughly coat the vagina with a solution of silver nitrate, 20 grains to the ounce, at two-day intervals, a cleansing douche to be used by the patient on the alternate days. The douche should be mildly antiseptic, small in amount (not to exceed one quart), and given with practically no pressure of the stream, one-half per cent formalin making an excellent solution for this purpose.

Abscesses developing in Bartholin's glands must be evacuated under local anesthesia and the cavity thoroughly disinfected with a strong silver nitrate solution or pure iodine. Such a plan of treatment will usually control the more violent type of infection.

Where the gonorrhea presents itself in the usual chronic form, manifested only by a profuse leucorrhea with a moderate thickening and congestion of the vaginal mucosa, treatment by means of the instillation of a drachm of brewer's yeast or the dry yeast spores marketed under several trade names, offers the greatest hope for relief.

The applications should be made every other day, the yeast held in place by a small pledget of absorbent cotton, placed just within the vulva, not in contact with the cervix. Cleansing douches, as outlined above, should be used on the alternate days. Gentleness of manipulation and avoidance of pressure on the cervix or fundus uteri are essential to success.

Should a pelvic peritonitis supervene, absolute rest in bed and the application of heat, together with the ordinary general therapeusis of infection, is the plan of treatment to be followed.

The use of antigonorrheal vaccine or serum has been advocated and some good results reported, but I personally feel some hesitation in administering sera during pregnancy, fearing a pronounced reaction with injury to the embryo.

Over the entrance to the operating amphitheater of one of Philadelphia's greatest surgeons there is painted in bold black letters the legend "Noli loqui, noli tangere" ("Say nothing, touch nothing"). No better motto could be devised to cover the entire principles of the management of labor in a woman the victim of gonorrhea. The less discussion of the details in a case of this kind, the less possibility of family misunderstanding and marital disturbances. Discretion on the part of the physician is here of the greatest importance. The "touch nothing" phrase of the motto, however, is the key-note of the conduct of labor. If the patient is to be spared the prolonged morbidity and the risk of death from a puerperal septic infection, two es-

sentials must be observed: there must be no traumatization of the genitalia, and there must be absolute asepsis, that no complicating organisms may enter the birth canal. How are these desiderata to be attained? In the first place labor must be spontaneous if at all possible. Hasty intervention with forceps or version is to be condemned. All manipulation, massage, Credé expression of the placenta, and the like are to be rigorously avoided. They are at best procedures of very dubious value, and are distinctly contraindicated in the presence of gonorrhea.

Vaginal examination should not be practiced in this group of cases. All necessary information regarding dilatation of the cervix, presentation, degree of engagement, progress of labor, etc., may be easily elicited by rectal touch, and the vagina thus remains entirely unused as an avenue of examination.

Obviously all precautions with regard to the cleanliness of the external genitalia should be put into practice. Removal of the pubic hair, and if necessary, by reason of infection, painting of the labia and the site of Bartholin's glands with a strong silver solution, should be done. After delivery, again *noli tangere;* no douche, no exploration of the uterine cavity, no extensive manipulation of the fundus through the abdominal wall.

I think that intermediate repair of perineal injuries, repair performed in from three to six days following delivery, is especially indicated in these cases. In the meantime careful irrigation of the external parts, by means of salt solution or boric acid poured from a pitcher, will tend to avoid mixed infection.

Immediately upon delivery the infant is to be protected against ophthalmia neonatorum by the irrigation of the eyes with silver solution according to the method of Credé.

By a close application of such general principles, and by a most painstaking attention to minute details, and in no other way, can gonorrhea be robbed of its terrors as a complication of pregnancy or labor.

1823 Chestnut Street.

REVIEW OF BLOOD COAGULATION STUDIES WITH MENTION OF A NEW COAGULATION AGENT.

BY VINCENT ANTHONY LAPENTA, M.D., AND GEORGE WALTERS, M.D.

[From the Research Laboratory, Parke, Davis & Company, Detroit, Michigan.]

Variations in the coagulating power of the blood are encountered in diverse manifestations of practical medicine. Excessive hemorrhages supervening upon a solution of continuity of the vascular walls, produced by traumatic or pathological processes, indicate diminished coagulability of the blood. Excessive transudation of lymph (serous hemorrhage) is intimately associated with this condition.

It also seems established beyond dispute that one of the most important factors of success and low mortality in modern surgery is the proper coagulation time of the blood. Indeed the most ideal conditions for an operation are intimately connected with the coagulability of the patient's blood. For these reasons a study of those agents which may enable one to attain this end is timely and interesting.

HISTORY AND DESCRIPTION.

In all cases of hemorrhage, the blood as it collects about the open wound should form an adhesion thrombus or coagulum by virtue of its inherent physiological properties, seal the openings in the vessels and prevent further flow. The formation of this coagulum depends upon the production of fibrin brought about by the action of fibrinogen and fibrin ferment (thrombin).

Thrombin is a product of blood coagulation. Fibrinogen and calcium are recognized constituents of the normal blood. In the process of coagulation thrombin is produced either from the combined action of

basic elements in the blood or the near-by tissues.

Thrombin (Howell[1]) is a derivative of prothrombin (proferment) which is associated with an antiferment which maintains, under suitable physiological conditions, an ideal equilibrium. According to this theory a thromboplastic substance (*infra*) neutralizes the antithrombin normally in the circulating blood and thereby permits the interaction of calcium and prothrombin which initiates the coagulation process. In the presence of an excessive amount of antithrombin the reverse is true.

A general review of hemostatic therapeutics elicits many very striking differences of opinion both as to the cause and treatment of hemorrhage. This is due in great measure to the many diverse theories of the physiology of the circulation and the pathology of the blood constituents. Recent investigations have shed considerable light upon these theories. Variously stated, the coagulation of the blood is brought about according to the following illustrated table of consecutive chemical processes, which is based upon final results in the study of prothrombin (Howell, *loc. cit.*):

Thrombogen (Leukocytes and Platelets)

Thrombokinase (Platelets and tissue) → **Thromboplastic substance Neutralizing Antithrombin** → **Prothrombin combining with Calcium** → **Thrombin** → **Fibrin Clot**

Fibrinogen

In fact, thrombin is shown by the following equation:

(Organic (Thromboplastic Substance) or (?) Antithrombin) (Plasma) + (Cellular) (Prothrombin (Cellular) + Inorganic Calcium) = Thrombin (Blood-plasma)

From this it will be seen that primarily the quantity of prothrombin or actual fibrin proferment present within the blood depends upon the properly balanced proportions of thromboplastic substance and antithrombin, an excess of the first increasing the prothrombin quotient by partial neutralization, or *vice versa*. Thromboplastin, or more properly thrombokinase (Howell[1]), and antithrombin (Howell[3]), while easily demonstrated in the blood serum, have the unsatisfactory relationship to practical biochemical products of purely hypothetical substances. For this reason, general interest in the biochemical features of blood coagulation as related to hemorrhagic diatheses has been limited to a few conscientious investigators who have attempted to arrive at some acceptable, non-contradictory evidence of an actual hemostatic or coagulating agent in the blood stream.

Starting with the first step in clot production following solution of continuity in the vessel wall from any cause, certain authors (Brodie,[2] Howell[1]) presuppose a thromboplastic substance derived from thrombogen (nucleohistone) (Luciani[25]) and thrombokinase. Thrombogen, it has been assumed, after various researches, is derived from the white cells, and possibly the platelets and the injured tissue cells, with which the blood comes in contact during active hemorrhage. The various theories are well summarized as follows (Drinker and Drinker[4]):

(*a*) Prothrombin arises from all the formed elements of the blood.

(*b*) Prothrombin arises from the leucocytes.

(*c*) Prothrombin arises from the platelets—(1) which are produced by leucocytes and erythrocytes; (2) which are independent elements.

(*d*) The formed elements of the blood have nothing to do with clotting.

(*e*) Prothrombin cannot be obtained

from blood-free tissue, so its source of origin must be in the blood itself.

Howell,[5] attempting to discover the source of prothrombin, was unable to determine positively its specific source. Lymph, bone-marrow (Drinker, *loc. cit.*, Duke,[13] Nolf[6]); leucocytes (Morowitz,[7] Bordet et Delange[8]); platelets (Wright,[9] Morowitz,[7] Nolf,[6] Bayne-Jones,[10] Deetjen,[11] Duke[14]); liver (Nolf[12])—these are some of the many sources variously mentioned from which this substance is derived, and in each case some plausible explanations are submitted.

Assuming, however, that somewhere out of this maze the source of prothrombin may be definitely shown, we have another factor, and a somewhat more potent one, with which to contend. This is antithrombin, which may or may not vitiate the results possible with the clot ferment. When this antiferment is physiologically proportioned to the thromboplastic content, the resulting proferment, combined with a certain necessary physiologically balanced amount of calcium from the soluble lime salts normally in the blood stream, releases thrombin which, acting upon fibrinogen in the manner of a ferment or catalyzer, changes it to fibrin. A clot is the ultimate result.

Antithrombin has been shown to have a remarkably high counter-active potency against thromboplastic ferment (Howell[3]), and paradoxical as it may seem the thrombin ferments as a rule have a comparatively low potential when opposed to antithrombin.

It is therefore evident that in order to counteract the substance antithrombin, a more concentrated elemental factor resembling the kinase is required.

Much work bearing on the source of antithrombin has been done, with the result that many workers (Howell,[3] Rich,[16] and others) have demonstrated that the liver and intestinal glands are responsible to a great extent for its production. Rich,[16] however, showed during experiments to determine the nature and properties of metathrombin that these glands are not entirely responsible, as complete occlusion of the vessels below the head blood supply did not stop antithrombin production in the head circulation. In view of this fact we must qualify the theory formerly advanced, at the same time accepting it in the main, since it has not been demonstrated that the major portion of the substance antithrombin is not generated, as shown by Howell.*

From the foregoing it will be seen that coagulation of the blood depends to no little extent upon the thrombokinetic coefficient of the serum. This is evidenced in the many cases of thrombosis in active febrile diseases where tissue destruction is pronounced (Mazentie[17]), and is also shown to be more powerful in autogenous than in heterogenous transplantations. This explains the many good results recorded of the use of fat and tissue transplants for hemostatic purposes (Green,[26] Sacca,[27] Horsley,[35] and others).

Working on this theory, the senior author of this article has demonstrated a newly isolated blood derivative which may easily be looked upon as the product of the coagulation process in that it undoubtedly contains the specific thrombokinetic substance in nearly its pure form, in addition to the proferment prothrombin.

General Properties.—This new substance† is a clear light amber-colored solution containing the specific antagonist to antithrombin. In relatively minute quantities this substance has powerful specific action and represents ideally many of the requirements of a blood-coagulating agency. When properly protected from the action of heat it is perfectly clear. This makes it physically adapted to intravenous, subcutaneous, intraspinous, or intraperitoneal use. There is no inconvenient waiting while solution is being accomplished, and a possible source of contamination is thus removed. Physiologically its action brings up many features which tend to throw light upon certain of the coagulation processes. Before going into the details of the experimental work carried out, the authors wish to preface the work with the following scheme as worked

*Experiments on animals in this laboratory are the basis for many of the arguments upon which these statements are made, and these are reported hereinafter.

†The authors suggest the word Hemoplastin as the name by which this substance shall be known.

out by Luciani,[25] which seems to intelligently sum up the preceding research conclusions explicitly and lay the way open for a definite working plan:

NUCLEOHISTONE.
(Paralyzes the action of leukonuclein.)

Leukonuclein. (In the presence of ca-ions becomes a coagulating ferment.)	Histone. (Arrests splitting of nucleohistone and paralyzes action of leukonuclein.)

The predominance of one or other of these three substances gives rise to various normal or abnormal states of the blood which can be tested quite easily by injections of albumose or similar reagents.

The part which each takes in the coagulation process has been the subject of innumerable studies. Addis[28] and Morowitz[29] both show that the addition of calcium has been found not only *not* to hasten coagulation but to actually delay it in many cases. As a rule physiological quantities of calcium are present, cases of calcipriva hemophilia being rare (Hess[30]).

Coagulating Power.—Comparative observations on animals were made with standard hemostatic and blood coagulation agents, under parallel conditions. The anesthetics used were ether, chloroform, trichlortertiarybutyl alcohol,* and the standard A. C. E. mixture. In most cases a preliminary hypodermic of morphine sulphate was given three-quarters of an hour before the time set for the anesthetic. The various results are shown in detail. The coagulation times were all taken with Bogg's modification of the Brodie-Russell coagulometer,[32] and in many instances checked by the Biffi-Brooks instrument[33] and test-tube method of Howell.

Since the results with these methods showed no appreciable variations the report will be confined to estimations by the Brodie-Russell-Bogg instrument, which is deemed most reliable by the authors in that the various physical changes are constantly before the operator, and such technical differences as are effected by the amount of blood observed, intermediate coagulation processes, temperature, etc., may be compared in the various specimens.

The wounds were made with a sharp pair of dissecting scissors on the anterior and lateral margins of the right lobe of the liver. Comparative observations were made with other well-known coagulating agents, separate wounds being cut for each observation. (Care was observed to wall off the previously injured area and clean the field before making new wounds.) Ether and chloroform anesthesia was employed in these operations as a rule; where any other anesthetic material was used it will be mentioned.

Protocol I.

The local hemostatic effect of the substances was tested by application on gauze to a resection of the liver approximately half an inch in depth. The degree of hemostasis is indicated by x, xx, and xxx. X indicates slight tendency to immobilize exudate which was pushed away by heavy blood-flow; xx indicates hemorrhage held for half a minute or more; xxx indicates permanent clot formed. Products A and B at the end of one-half minute showed hemostasis of the x degree and after 1¾ minutes xx. The experimental serum derivative after half a minute showed xx, and after 1¾ minutes xxx.

The technique has much to do with the results obtained in this procedure. In applying the material the gauze should be applied directly to the wound and firmly held there for the interval of time desired, after which it should be carefully removed, avoiding any wiping effect by lateral motion, since this serves to brush away any formed thrombus. In order to ascertain whether any increased action might be expected from a preliminary injection the following experiment was tried:

Protocol II.

This was an experiment to determine the effect of local applications after preliminary injection of 1 Cc. of the substance 20 minutes before work was begun. The hemostatic effect of the various materials tested may be designated as follows:

*Known commercially as chloretone.

Product A, after ½ minute, x.

Product B, after ½ minute, xx; after 1 minute, xxx.

Product C, after ½ minute, xxx.

Experimental serum derivative, after ½ minute, xxx.

Adrenalin, after ½ minute, xxx.

Water (distilled), after ½ minute, x; after 1 minute, x; after 2 minutes, xxx.

Anesthetic, trichlortertiarybutyl alcohol 0.2 gms. per kilogramme weight and A. C. E. mixture.

The normal coagulation time for this animal, a black adult bitch spaniel, about 11 kilogrammes, was 5 mins. 40 secs. Twenty minutes after the injection of 1 Cc. of the experimental material the coagulation time was 2 minutes 35 seconds, two separate tests being made. The observations covered a period of 2 hours 20 minutes, at the end of which the coagulation time was 2 minutes 40 seconds. Blood-pressure remained approximately normal, and the animal was killed. A rather surprising and unlooked-for action on the application of gauze soaked in distilled water brings out another feature in the coagulation process, probably due to presence of minute quantities of alkali substances as well as the mechanical static effect upon the blood-flow when exerted long enough for it to coagulate and immobilize by virtue of the preliminary dose of the hemostatic agent.

This observation led to the following experiment to determine the actual effect on the coagulation time of the blood, *in vivo*, when the substance was employed:

Protocol III.

This experiment was carried out in order to determine the efficiency of the substance when given intravenously for the purpose of shortening the coagulation time of the blood. A maximum effect is sought. Large brown mongrel hound, about 16 kilogrammes. Apparently normal. No anesthetic.

On January 26, 1 mil (Cc.) of experimental serum derivative was given intravenously, coagulation at that time being found to be 6 minutes. Subsequent observations of the coagulation time on the same date showed it to be as follows:

3:05, 3 mins. 10 secs.; 3:10, 3 mins. 10 secs.; 3:40, 3 mins. 7 secs.; 4:40, 3 mins. 8 secs.; 5:15, 3 mins. 12 secs.

At 9 A.M. the following day the coagulation time was found to be 5 minutes 20 seconds, at which time another injection of 1 mil (Cc.) experimental serum derivative was given by intravenous route. Observations on the coagulation time following this injection were as follows:

9:20, 2 mins. 40 secs.; 10:20, 3 mins.; 11:30, 2 mins. 50 secs.; 2:30, 3 mins. 3 secs.

At 2:30 another injection, 2 mils (Cc.), of the experimental serum derivative was made intravenously. Coagulation time, following this injection, was as follows:

2:40, 2 mins. 30 secs.; 3:30, 2 mins. 25 secs.; 4:30, 2 mins. 35 secs.; 5:15, 2 mins. 30 secs.

At 9 A.M. the following day (Jan. 28, 1917) the coagulation time was 4 minutes. Dog was reinjected with 5 mils (Cc.) experimental serum derivative intravenously. At 9:20, coagulation time was 2 mins. 20 secs.; at 10:30, 2 mins. 30 secs.; 5:30, 3 mins. 25 secs. Two weeks later (2/10/17), coagulation time was tested, and found to be 5 minutes 50 seconds. At this time dog was reinjected intravenously with 2 mils (Cc.) experimental serum derivative. Twenty minutes later, coagulation time was 3 mins. 5 secs.; 1 hour later, 3 mins.; and after 8 hours, 3 mins. 10 secs. No ill effects followed these injections, dog appearing to be healthy at end of treatment.

This animal was kept for two weeks more and finally used on other work. Blood specimens were taken from dry clean ear wounds, which produced a good drop in each case, the same instrument being used for all.

Repeated efforts to produce thrombosis with the new substance failed. In one instance 40 mils (Cc.) were given intravenously to a young adult rabbit weighing 1500 grammes, while 15 mils (Cc.) administered to a rabbit of 350 grammes did not produce any ill effect whatever.

Experiments on dogs also corroborate

this work. The protocols here given demonstrate the results.

Protocol IV.

Small black mongrel, weight 11.25 kilogrammes; anesthetic chloretone, 7 grammes per kilo. Morphine ½ grain per hypodermic, ¾ hour before bringing to table. Anesthesia complete 1:15 P.M. Ten mils (Cc.) experimental serum derivative were given to this dog every hour until 5:15, a total of 50 mils (Cc.), and the next morning, the animal still being unconscious owing to the anesthetic used, another 30 mils (Cc.) were given intraperitoneally, making a total of 80 mils (Cc.) within 22 hours, or about 3½ mils (Cc.) per pound of weight. During this observation the following coagulation times were recorded:

2/13/17, 1:15 P.M., coagulation time 5 minutes 5 seconds; 3:20 P.M., 2 mins. 30 secs.—dog had received at this time total of 20 mils (Cc.); 4:30 P.M., coagulation time, 2 mins. 28 secs.—total amount injected up to this time, 40 mils (Cc.); 5:30 P.M., coagulation time, 2 mins. 29 secs.—total amount injected, 50 mils (Cc.). 2/14/17, 9:30 A.M., coagulation time, 3 minutes; 10:40, coagulation time, 2 mins. 25 secs. —total amount which had been injected, 70 mils (Cc.); 12 M., coagulation time, 2 mins. 30 secs.—total amount given, 80 mils (Cc.).

Here again the fact of a minimum coagulation time for the blood (Rettger[33]), when excessive doses of experimental blood derivative is given, indicates that with the stimulation of the hemopoietic and renal activities (*infra*) an increase in the antithrombin content of the blood takes place, proportionate to the amount of thrombokinetic factors added. (This theory is compatible with Luciani's scheme previously mentioned). It is further elucidated by observation of the clotting power on sheep's plasma *in vitro*. The antithrombin in this case is, of course, constant for the experiment. In another portion of this paper the small percentage of total solids (1.43 per cent) and the specific gravity (1.0050) is commented upon. Since the calcium content of the serum is withdrawn in the preparation of this experimental blood derivative, this substance (calcium) in the form of the chloride was added for all tests *in vitro*, in physiological quantities, so that the desired results might compare with those of other coagulating agents. The method employed by the writer is easily followed in the table below.

Six test-tubes are used in this series with graduated quantities of the material as shown:

Degree of Coagulation.

Coagulating Substance.	Sheep Plasma.	Water, distilled.	Incubated 15 min. at 37°.	Incubated 25 min. at 37°.
.6 mil (Cc.)	.5 mil (Cc.)		xxx	xxx
.4 " (Cc.)	.5 " (Cc.)	.2 mil (Cc.)	xxx	xxx
.2 " (Cc.)	.5 " (Cc.)	.4 " (Cc.)	xxx	xxx
.1 " (Cc.)	.5 " (Cc.)	.5 " (Cc.)	xx	xxx
.05 " (Cc.)	.5 " (Cc.)	.55 " (Cc.)	x	xx
.025" (Cc.)	.5 " (Cc.)	.575" (Cc.)	x	x

xxx indicates solid coagulation throughout; xx, partial coagulation; x, slight coagulation (sticks to side, giving a curious "sucking" noise upon shaking free—no coagulation).

Upon adding 0.3 per cent of calcium chloride the whole set were coagulated with exception of highest dilution, which was xx. Upon adding 3-per-cent calcium chloride, spontaneous coagulation took place, the tubes being solid before reaching the incubator.

An interesting comparative test made with Products A, B, C, and the experimental product above mentioned, is deemed worthy of mention in this paper.

The same dilutions as above were used. The results only are tabulated for 15- and 30-minute incubation periods:

Dilution.	Product A. 15 min.	Product A. 30 min.	Product B. 15 min.	Product B. 30 min.	Product C. 15 min.	Product C. 30 min.	Exp. Serum Derivative. 15 min.	Exp. Serum Derivative. 30 min.
No. 1	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
No. 2	xxx	xxx	xx	xxx	xxx	xxx	xxx	xxx
No. 3	xx	xx	xx	xx	xx	xxx	xxx	xxx
No. 4	–	x	xx	xx	xx	xx	xx	xxx
No. 5	–		–	x	x	xx	x	xx
No. 6			–	–x	–	–	x	xx

The superior clotting power of this serum derivative was evident throughout a long series of tests. Under anaphylactic reaction this agent is discussed again.

Physiological Action.—Considering the low protein content, probably the most interesting feature of the physiological reac-

tion of this substance is the effect it has upon the blood-pressure. This action has been carefully observed throughout the series of observations on animals and has been verified clinically by the results obtained in the operating-room. It was noted early in the clinical work that shock was a minor factor in postoperative treatment of those cases to which this substance had been administered. This was soon shown to be largely due to the effect upon the nephritic and hemopoietic system and the secondary effect upon the splanchnic nervous system. Observations were made with a standard mercury manometer, graduated, however, to percentage ratios rather than millimeters, it being at first intended only to show relative conditions of blood-pressure changes rather than actual pressure readings. The results are therefore slightly confusing to those not having observed the changes, but are at the same time obvious.

Crile[19] demonstrated the effect of splanchnic nerve irritation to be widened principally in lowered blood-pressure. He also showed that any stimulation, crushing, mutilation, etc., generally showed slightly *increased* blood-pressure which remained so for a considerable period.[20] During the experiments with wounds of the liver *(supra)*, it was noted that a general tendency to lowered blood-pressure was early presented, and that in most cases an intravenous injection of the derivative intended to increase the blood-coagulating efficiency had the unexpected effect of increasing the pressure, restoring it to the normal or initial reading which was obtained immediately after perfect anesthesia had been produced.

Stimulated by these results, corroborative evidence was sought, which ultimately resulted in considerable study of the physiological action of the substance.

Stevens and Lee, 1884,[20] in the course of perfusion experiments, demonstrated the presence of an active vasoconstricting substance in defibrinated blood which was apparently due to some product of the coagulating process. O'Connor, 1911,[21] verified these findings with the conclusion that epinephrin content was negligible as a determining factor. Falta and Flemming, 1911,[22] confirmed these results.

Sollman[23] showed that serum produces a direct vasodilator effect upon the isolated kidney, limited to the efferent vessels, and since then Brodie[24] demonstrated this action to be due to an albumen protein which in this substance is eliminated.

Before discussing its action the following protocols are of interest and serve to illustrate some of the facts to be mentioned:

Protocol V.

Well-nourished, healthy young black spaniel, weight 10 kilogrammes. Ether anesthesia. Immediately upon production of narcosis, a cannula was introduced in the left carotid artery and manometer attached. Normal reading showed at 50° —about the normal point for readings usually made with the type of manometer in use in any laboratory. All readings are comparative and the actual figures will be given in this protocol.

At 1:20 anesthesia was complete, blood-pressure being 50°. At 1:24 intestines were handled roughly and exposed to air. At 1:50 blood-pressure was found to be 39°. At 1:52, 1 mil (Cc.) of the experimental serum derivative was injected subcutaneously. Following this observations of the blood-pressure were made as follows:

1:53, 45°; 1:54, 49°; 2:25, 50°; 2:45, 45°; 3:30, 32°; 3.45, 35°.

At 3:45, animal was reinjected subcutaneously with 1 mil (Cc.) experimental serum derivative.

3:47, blood-pressure of 43°; 3:49, 48°; 3:50, another subcutaneous injection of ½ mil (Cc.) experimental serum derivative was made. At 4:05, blood-pressure of 53°, and at 4:20, 50°. Animal was killed at 4:20.

Duration of observation 3 hours and 20 minutes.

Pressures taken on peripheral and central circulations are also interesting.

Protocol VI.

Well-nourished bulldog, weight 16 kilogrammes; anesthetic, ether and chloretone.

Manometers connected with brachial and femoral arteries for peripheral pressures and portal vein, and renal artery for central circulation.

At 9:45 anesthesia was complete, blood-pressure being 54°; 9:55, ¾ mil (Cc.) experimental serum derivative injected; 9:57, blood-pressure readings were as follows: Femoral, 56; portal, 58; renal, 55.

At 10:15, ¾ mil (Cc.) was injected. Blood-pressure was found to be—femoral, 58; portal, 60; renal, 62. At 10:30, femoral blood-pressure was 54; at 11:10, femoral 55, portal 59; at 11:20, renal pressure, 61.

Protocol VII.

At 11:20 the viscera were manipulated, and hemorrhage was produced in liver by making ½-inch resection.

At 11:35, 1 mil (Cc.) was injected, blood-pressure at that time being, femoral, 48; portal, 55; renal, 58. At 11:40, pressure was femoral, 52; portal, 60; renal, 63. At this time hemostasis was produced by tamponage with experimental serum derivative. At 12:15 pressure was femoral, 53; portal, 61; renal, 62. At 2 P.M., femoral, 48; portal, 58; renal, 60. At this time the condition of the animal was good; respiration was about 12 per minute. The viscera were exposed to cold and were freely manipulated. At 2:45, 1 mil (Cc.) was injected, the blood-pressure being femoral, 40; portal, 39; renal, 45.

It will be observed that there had been a decided fall; the diastolic pressure was especially low.

At 3:05, the femoral pressure was 45; portal, 56; renal, 55. Pressure remained stationary until 4:15, at which time animal was killed.

Duration of observations, 6 hours and 30 minutes. All administrations were given intravenously. These observations were verified with other animals, slight difference in ratios being noted owing to varying physical conditions.

A gross interpretation of these results can only be made after careful consideration of all effects produced by this new substance. It will be remembered that thrombosis is practically an impossible result from its use; that there is no marked physiological reaction beyond the stimulation of central blood-pressures in a certain degree and the marked blood-coagulation effect.

Reviewing the work as a whole, it seems difficult to sum up all the facts which best serve to substantiate these views. In general, we may state that:

(*a*) The minimum coagulation time obtainable has been 2 minutes and 20 seconds.

(*b*) The blood-pressures at this time are normal.

(*c*) Under excessive shock-producing operations, the use of the new blood derivative intravenously serves to maintain the normal blood-pressure for hours. (Pressure readings indicate this to be due partly to stimulation of the adrenals.)

(*d*) Antithrombin is increased in the blood-stream nearly in proportion to the antagonistic elements present after a certain point has been reached. (See work on activity, ***supra.)***

(*e*) Protein content is reduced to a minimum, as evidenced by the lack of anaphylactic shock over prolonged periods of observation.

Anaphylaxis.—Various experiments were tried on guinea-pigs and rabbits for anaphylactic reactions, but to date no serious alterations from the normal have been noted. This is in accordance with the fact that the percentage of total solids is only 1.45, and the protein content is very low. As related elsewhere in this paper Brodie[24] shows certain correlating facts concerning albumen proteins which in the case of the substance here mentioned are eliminated.

CONCLUSIONS.

In the light of the prevailing doctrines on blood coagulation, and the treatment of hemorrhage, it seems established that:

1. An ideal agent capable of increasing the coagulability of the blood and exhibiting high therapeutic value in hemophilia must contain in addition to prothrombin

the specific thrombokinetic substances of the coagulation process.

2. The protein content of such product should be minimal, and the product must be active in small doses.

3. The administration of calcium salts in the treatment of hemorrhage is irrational because it is proven that an increase of ca-ions in the blood beyond the physiological point prevents coagulation, and that cases of diminished coagulability due to deficiency of calcium are rare.

4. A serum derivative based on the foregoing theories exhibits these true physiological requirements, giving uniform and quick results in all instances.

BIBLIOGRAPHY.

1. Howell, W. H.: *Am. Jour. Phys.*, vol. 29, 1911, p. 187.
2. Brodie, T. G.: Essentials of Experimental Physiology.
3. Howell, W. H.: Also *Arch. Int. Med.*, Jan., 1914, p. 76.
4. Drinker, O. K., and Drinker, K. R.: *Am. Jour. Phys.*, vol. xli, 1, July 1, 1916, p. 5.
5. Howell: *Am. Jour. Physiol.*, 1914, xxxv, 483.
6. Nolf: *Arch. Internat. d. Physiol.*, 1906, ix, 165.
7. Morowitz: *Deutsch Arch. f. Klin. Med.*, 1904, lxxix, 215.
8. Bordet et Delange: *Annals d l'Instit. Past.*, 1912, xxvi, 737.
9. Wright: *Jour. of Morphol.*, 1910, xxi, 263.
10. Bayne-Jones: *Am. Jour. of Physiol.*, 1912, xxx, 74.
11. Deetjen: *Zeitschr. fur Phys. Chem.*, 1909, lxiii, 1.
12. Nolf: *Arch. Internat. d. Physiol.*, 1905, 6, iii, 1.
13. Duke: *Arch. Int. Med.*, 1913, xi, 100.
14. Duke: Behav. of Platelets, *Johns Hopkins Hosp. Bul.*, 1912, xxii, p. 144.
15. Howell: Human Physiology.
16. Rich, A. R.: *Am. Jour. Physiol.*, 1917, xliii, 4, p. 549.
17 Mazentie: Human Physiology.
18. Crile: Surg. Shock, 1899, p. 130.
19. Crile: Surg. Shock, 1899, p. 132.
20. Stevens, L. T., and Lee, F. S.: Studies Biol. Lab. Johns Hopkins Univ., 1884, III, 99.
21. O'Connor, J. M.: *Münch. Wchnschr.*, 1911, lviii, 1439.
22. Falta, W., and Flemming, G. B.: *München. Med. Wchnschr.*, 1911, lviii, 2649.
23. Sollman, T.: *Am. Jour. Physiol.*, 1905, xii, 291.
24. Brodie, T. G., *Am. Jour. Physiol.*, 1900, i, xxvi, 48.
25. Luciani: Human Physiol., 1911, vol. i, p. 138.
26. Green, J. B.: *Surg., Gyn. and Obs.*, xxiv, 5, May, 1917, p. 547.
27. Sacca: *Polyclinics*, Dec. 10, 1916.
28. Addis, T.: *Jour. Path. and Bact.*, xv, 1911, 247.
29. Morowitz, P.: Handbuch d. Biochem. Arbeits methoden., Bd. I, 1911, 233.
30. Hess, A. F.: *Johns Hopkins Hosp. Bull.*, vol. xxvi, 1915, p. 372.
31. Hinman, F., and Sladen, F. J.: *Johns Hopkins Hosp. Bull.*, vol. xviii, 1907, p. 213.
32. *Ibid.*, p. 210.
33. Rettger, L. G.: *Am. Jour. Physiol.*, 1909, xxiv, p. 434.
34. Rowe, L. W.: *Jour. Pharm. and Exp. Therapeutics*, 1916, vol. ix, p. 107.
35. Horsley, Sir Victor: *Lancet*, July 4, 1914, p. 8.

THE WISE CHOICE OF THERAPEUTIC MEASURES.

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Almost as dangerous as therapeutic nihilism, and indeed essentially of the same nature, is the tendency to limit treatment to the employment of powerful agents, whether of the nature of drugs or otherwise. It is natural that the growth of scientific medicine should demand positive evidence of the efficacy of a therapeutic agent, just as it does in the laboratory or at the bedside of a diagnostic test. There is nothing quite so convincing as the removal of a diseased organ or menacing pathologic focus. But careful observation shows quite as definite though more recondite and slightly less prompt effects from certain drugs, as croton oil, digitalis, morphine, adrenalin, as well as from certain radiant and other forces. Hence there has arisen a class of physicians whose medical treatment is limited to the use of sledge-hammer methods. That they get immediate effects is undeniable, but in many instances the method is subject to the same criticism as that of the too-ready operator. The patient may not survive the treatment; he may survive, but in a damaged state; he may have suffered unnecessary positive effects, and means of relief may have been omitted; a

recurrence of the condition or the development of sequelæ appeals vainly to the attendant, except as he may repeat therapeutic assaults quite comparable to repeated and badly chosen surgical assaults.

That there are numerous cases demanding prompt and radical operation, at whatever direct risk, no sane man can question. So, too, we must admit that there are cases for medical treatment in which we must stimulate by hot enemata at 55° C., and in which lower temperatures would not only fail but actually increase portal congestion; in which chloroform or 3-centigramme doses of morphine or teaspoonful doses of tincture of digitalis must be given without hesitation. To temporize with small doses and milder measures may be cruel as well as foolish. This paper is not presented, therefore, as a plea for therapeutic puttering nor as an index of personal proclivities. If anything, it is the voicing of a self-inflicted discipline against the temptation to disregard minor conditions of discomfort and to neglect details while concentrating the attention on main issues directly diagnosed by rigid tests and attacked in the same stern spirit.

There are local applications, as to hemorrhoids, superficial ulcers of the skin or mucous membrane, and similar applications, swallowed to be sure, but just as truly local, for the stomach and possibly bowel, whose action is rendered much more comfortable if orthoform, hyoscyamus, belladonna, anesthesin, etc., are added, and if care is taken to choose an unirritating base, as a mineral oil.

In a recent case of hemicrania of severe, recurring type, due to hypochlorhydria and indol formation in the stomach, the use of the high-frequency current anticipated, from the patient's standpoint, anything approximating genuine relief, by a day or more. By lowering blood-pressure it is conceivable that it tended also to restore circulatory equilibrium, and thus actually aided in the resumption of active secretion with the consequent inhibitory action upon intestinal bacteria. Even the mere use of camphor, chloral or some similar application would, at least, have added to the comfort, and, while not directly affecting the circulation, would have removed or mitigated the excito-reflex stimulus of pain.

We are prone to forget that pain, even discomfort, physical or mental, is an important factor in disturbing physiological functions and in determining organic lesions. General anesthesia was, at the beginning, lauded solely from the standpoint of mercy. It was soon established that it actually diminished shock and danger. Rather recently, Crile's experiments and investigation of clinical cases seem to have demonstrated that pain, fatigue, shock, and even such minor shocks as unpleasant and disturbing emotions, produce actual lesions, perhaps permanent, in the Purkinje cells. Hence a ridiculously minor drug, such as helonias, viburnum, dioscorea, a palatable and esthetic preparation, a satisfactory tasteless substitute for a bitter drug, or an efficient means of concealing a disagreeable taste, may in a long series of cases mean a difference in mortality statistics. For this reason the writer finds himself more and more oblivious to "ethics," taking less and less pride in his own ability to write an extemporaneous prescription, cribbed and recribbed from authorities; less and less insistent that the patient, or the druggist, should save a few cents on such a prescription; and more and more inclined to use whatever proprietary compound may suit the case, in view of the fact that years of effort and large amounts of money have been concentrated on obtaining slight differences of taste, consistence, flavor, etc. Of course, this is not meant to imply that the writer is willing to use any nostrum advertised, nor that he is indifferent to honesty of preparation and plain statement of ingredients. If any justification is required for this change of heart, it is the practical consideration for the patient's comfort and a reversed application of the fallacy of the "just-as-good" argument. The crucial test in any such question is whether the manufacturer has imitated—as he undoubtedly and confessedly has—and produced something just as good, or

whether the prescriber is trying to show his independence by imitating the revised imitation of the manufacturer and substituting his crude mixture and the local druggist's crude methods for a really perfected article. The writer wants the most active, least toxic, and least irritating preparation of digitalis obtainable; and he wants also the best mouth-wash, liniment, salve, tonic, or any other compound. As to whether the indication is best met by such a compound as the manufacturer usually supplies, or whether it is best met by a one-active-drug prescription, is another question to be determined just impartially.

A coryza is a trivial condition, but for most of us it spoils the efficiency of several days' labor. We ought to be able to use as good business judgment, be as tactful and forceful in managing other persons, have the same delicacy of touch or strength in manipulating a tool, learn our lessons as well, with our nose congested or raw from the constant flow of mucus as in our normal state—but we are not. Not to mention various more systematic methods of treatment, an atomizer filled with pure mineral oil containing one per cent each of camphor and menthol, or a pledget of cotton moistened with a drop of oil of peppermint, and inserted into one nostril and then the other, will afford great relief.

Much has been written regarding the danger of coal-tar antipyretics in fever, yet in transient fevers, not typhoid, when the heart is strong, their occasional use is not only justified but demanded.

Few physicians have expressed themselves more strongly than the writer as to the rarity of the indication for pepsin and as to the necessity of ascertaining definitely the nature of a gastric perversion, and treating accordingly; yet it must be admitted that occasionally it is worth while simply to force ferment action by pepsin, or one of the vegetable digestants, so as to afford immediate relief by lessening the pabulum for putrefactive and fermentative bacteria.

There is certainly no milder and safer chemical than water, yet it is one of our most useful drugs. So much has been written on the subject that only three details will be mentioned. For stimulation in emergency, hot salt solution, 55° C. (131° F.), by bowel, is the most efficient means at our disposal and much more efficient and immediate in its action than saline solution by hypodermoclysis. In hepatic torpor an afternoon devoted to drinking very hot water, with a little fruit juice or jelly added, taking 100 Cc. at a time, and 1 to 2 liters in all, virtually accomplishes a hepatic lavage. The kidneys also are stimulated and considerable elimination of toxic matters can be accomplished speedily. Hot water half an hour before meals or late at night also accomplishes much in various gastric conditions, but should not be used indiscriminately. Mucus, stagnation, and failure of secretion are the three principal indications. For the last, small additions of ammonia or sodium bicarbonate are indicated, before, not after, meals.

There are a great many conditions in which more or less pain exists, either locally in the alimentary tract or elsewhere. This complication may seem trivial, but its relief may aid considerably in checking the underlying condition. A local gastric pain is usually relieved by orthoform or anesthesin, so that the result is of diagnostic value. Pain due to biliary calculi, adhesions, and various other deeper-seated lesions, is absolutely unaffected by true local anesthetics, but may be assuaged by cocaine, Meltzer having shown that its action is really general and not merely local. A good preparation of cannabis indica is often efficient against pain, especially that of hyperchlorhydria and gastric ulcer, and it has very little mydriatic objection. Infusion of fresh catnip tops, or the oil, is quite a good "antispasmodic." Some one has well said that no antispasmodic drug is of any value in a spasm.

Menthol is a valuable drug in determining better circulation to mucous membranes, reducing bacterial growth, and increasing secretion. It should not be used in conditions of irritation, but camphor may be substituted. While the mints are

generally regarded as very mild remedies, several of them, as the various menthæ, horse balm, etc., are of considerable value. The fact that menthol may produce toxic states and serious irritation locally should increase our respect for it. For example, after a teaspoonful of the oil of peppermint, deafness and alarming syncope were noted.

Painful conditions of the pharynx and esophagus may not be due to inflammation at all in the ordinary sense but to rheumatism. In such cases salol 5 per cent in pure mineral oil by spray or swallowed in small doses, which should never exceed a gramme a day, gives surprising relief.

The same preparation applied to the skin in erysipelas may reduce inflammation in three or four days.

In cases of gall-stones, especially when the diagnosis is suggestive and not positive and conditions for operation are unfavorable, menthol, phenolphthalein, salicylic acid, sodium acid oleate, and bile salts often produce great relief. Such treatment will, at least, check bacterial processes in the biliary passages, and the writer is inclined to think that the free flow of sterile bile gradually disintegrates calculi. At any rate, the spontaneous passage of calculi is an established fact, and if, from inattention to the stools, calculi are not found but the symptoms of gall-stone abate, it is unnecessary to assume that our diagnosis was wrong in every case.

In the ordinary grade of cystitis, with no allusion to severe infections, with or without calculi, cancer, angiomata, etc., it is almost never necessary to resort to irrigation. Ammonium benzoate will gradually act as an antiseptic, and, in fact, sometimes acts more promptly than lavage.

So far as cathartics are concerned, it is a good rule that no powerful drug is efficient in the treatment of constipation, although as an occasional evacuant, compound jalap powder—which is not so powerful as Oliver Wendell Holmes's poetic allusion implies—compound cathartic pills, calomel, and the various familiar names, are indicated. The continued use of salines is objectionable as tending to reduce gastric acidity. Chronic constipation, aside from local measures, depends largely on diet. The introduction of seeds and of fermenting foodstuffs does oppose constipation, but introduces an equally serious condition. Water and spongy cellulose in moderate quantities, moderate but not excessive use of fats and oils, sum up the dietetic treatment. Aside from diet, and granting that there is no indication for some form of radical local measures, the writer has reduced the treatment of constipation to three drugs—cascara, phenolphthalein, and pure mineral oil—the last acting solely as a lubricant and cleanser with the soaps normally present in the intestine, just as paraffin, kerosene, or almost any other mineral oil product expedites the action of soap in the laundry. With mineral oil, two or three tablespoonful doses daily, and enough phenolphthalein or cascara to reëforce it by direct stimulation of peristalsis, apparently even cases of hopeless constipation may gradually be cured, and, if not, kept in a state of comfort indefinitely.

A very excellent drug is soap, neutral, unperfumed, without the addition of antiseptics. At any rate, in gastric lavage, colonic lavage, removal of masses from the rectum or ear, for oral asepsis, plain soap is about as satisfactory an agent as we possess.

A case of diarrhea of eight months' standing, with so frequent evacuations as to exhaust the strength and to interfere with all forms of social life, was practically cured in eight days by applications of 5-per-cent protargol to a few ulcerations in the sigmoid. The fact that the introduction of the sigmoidoscope to the depth of a foot is a rather difficult feat should not blind us to the fact that the therapeutic measure itself is of the definite kind. Similar treatment of a linear ulcer at the anus, or of a nasal fissure, or any similar treatment, impresses one as trivial, yet it is equally important.

In this connection may be mentioned the fact that occult blood or black blood in the feces may come from the accessible fourteen inches of the lower bowel, so that the

lesion may be locally reached by very simple means, barring the mechanical difficulty of inserting the speculum.

Very obstinate nervous and metabolic disorders, often apparently involving the abdominal organs in such a way as to suggest major operation, are sometimes due to deficiency of phosphorus, as indicated by a persistent low phosphatic elimination. Other conditions are easily checked off by urinary titration, to consist in an excess of acid radicles in the blood, and, while their exact nature may require further study, prompt relief may be afforded by the administration of soda. Again, hysteria major, pronounced cardiac weakness, and the most varied symptom-complexes, may give a dark-blue indican reaction, and will be promptly relieved by calomel, enemata, and, with due apologies, by such antiseptics as salacetol, diacetic acid, menthol, etc. It is not intended to imply that such measures will sterilize the feces, but they certainly will reduce the virulence of putrefactive organisms. Here, too, we find the legitimate field for lactic acid bacilli in one form or another, and especially in milk preparations. This method, so enthusiastically advocated a few years ago, was used indiscriminately, and inevitably in the cases of excessive fermentation which form the majority of any series of cases of intestinal indigestion. Hence the condition was usually aggravated, and the lactic acid bacillus fell into disrepute.

Cactus grandiflora has come to have almost an unethical status, yet there are numerous cardiac cases in which one wishes not increased force, not change of rapidity; there is not even a gross disturbance of rhythm, yet there is an obvious need of "steadying" the heart. The writer knows of no accepted cardiac drug which fulfils this indication, and he is rather doubtful of the value of cactus, but there is a deep-rooted professional opinion, and considerable clinical confirmation of the opinion, that a good preparation of cactus does come somewhere near fulfilling this indication.

No attempt has been made to cover the subject chosen with any system nor with any degree of thoroughness. The writer would certainly not have it understood that he neglects major indications and major methods of treatment. But the wonderful development of scientific medicine has thrown into the background the many minor helps of the old-time doctor and the natural and proper desire of the patient for comfort as well as scientific attention to his ailment. We have not progressed far enough to abandon minor therapeutic measures and the skill of our fathers in medicine in using them.

FAULTY METABOLISM OF FOOD ELEMENTS DUE TO DEFICIENT VITAMINE.

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Many children are brought to the physician showing marked pallor of the skin; their muscles are flabby, and they perspire easily. Examination of the blood shows a secondary anemia. There is imperfect metabolism of the fat, protein, and carbohydrate elements of the food. The stool frequently contains mucus, and shows an undigested condition. The weight remains staionary, or there is but slight gain during many weeks. These infants show symptoms of a disordered nervous system; they are peevish and dissatisfied by day, and restless at night. Something is lacking, and this something must be supplied or a "deficiency disease" develops. Such condition is usually manifested by a structural weakness in which bony and muscular defect is found.

Scientists have for years claimed that scurvy was caused by abstaining from fresh vegetables, or from a too generous use of boiled or canned foods. The absence of a live factor was known theoretically. It remained for Funk and his collaborators to demonstrate experimentally that beriberi could be produced by feeding polished rice, and could be cured by feed-

ing unpolished rice. They further demonstrated the presence of a crystalline substance which could be isolated, and to which the name of "vitamine" was given. This vitamine when absent from food is responsible for the development of scurvy. Funk further found that when the vitamine necessary for the proper metabolism of food, and especially of carbohydrates, was absent there results therefrom a condition described by him as a "deficiency disease."

Vitamine can be supplied to the body by giving autolyzed yeast. This has been the subject of clinical and experimental study, and was published in *American Medicine*, November, 1916, by Stark and Edelman.

To determine whether or no the active substance was a complicated product of a protein or phosphatide nature, Funk subjected yeast to the hydrolyzing action of 20-per-cent sulphuric acid for twenty-four hours. It is known that this concentration of acid acting for the above-mentioned length of time hydrolyzes all the ascertained existing complex products, as, for instance, proteins, polysaccharids, nucleic acids, and lipoids. The work done by Funk in conjunction with Cooper[1] showed that yeast treated in this way possesses very nearly the full action of the original yeast. At the same time this gave a hint as to future procedure and led to the introduction of autolyzed yeast as a curative agent by Cooper.[2]

My personal experience with autolyzed yeast in liquid form and with vitaphos in dry form dates back one year. My results were published in the *New York Medical Record* of July 7, 1917.

The following series of cases will show the types of cases selected wherein deficiency disease of one or another form existed:

India H. was seen by me in consultation with Dr. Wrenn at the Ossining Hospital, in March, 1917. The infant was asphyxiated at birth, cyanotic, and resuscitated with the aid of a pulmotor after fifteen minutes. Forceps delivery; external traumatism, slight facial palsy. Weight, 5½ pounds at birth. No food was taken during the first four days; later food was refused.

When first seen the infant was emaciated, and there was marked icterus neonatorum. Temperature 98.6° by rectum, respiration 72. To sustain strength gavage was ordered. There was marked dulness on the right side, lower lobe, and rigidity of the extremities. The stomach was lavaged with bicarbonate of soda, 1 drachm to a pint of warm water, and the infant fed by gavage every three hours, one-half drachm of condensed milk in two ounces of water, gradually increased to 1 drachm in 3 ounces of water. One drop of adrenalin was given morning and evening. Colonic injections of saline solution were given at a temperature of 105° two times a day. Convulsions were present. Intracranial pressure was relieved by means of lumbar puncture, and 10 Cc. of slightly opalescent spinal fluid withdrawn. The infant relaxed and convulsions ceased. The appetite improved, and the infant gained in weight about 4 to 6 ounces a week. This rate of gain continued during the summer. During the first two months skimmed milk and peptogenic milk powder were given. The feeding was then changed to whole milk, granum, dextri-maltose, and water. In conjunction with this restorative diet, 1 grain of vitaphos was given three times a day. Spinach juice was given for its antiscorbutic effect. The dose of vitaphos was increased until 2½ grains were given three times a day.

Liza S., born December 24, 1916, at the Lutheran Hospital of this city, weighed 4 pounds at birth. First baby, full term. Was breast-fed about four weeks; later fed on milk and barley water; still later granum was given.

When seen by me the infant had marked signs of rickets, beaded ribs, asthmatic wheezing, seborrhœa capitis, a tendency to constipation, head sweating, and a bulging fontanel. The tongue protruded, and there was marked backwardness in development. A restorative diet, consisting of cereals, vegetable and fruit juices, was given. The weight increased and a general improve-

[1]Cooper and Casimer Funk: *The Lancet*, May 4, 1911.
[2]Cooper: *Biochemical Journal*, June, 1914.

ment was noted. Owing to the low weight at birth it was thought advisable to aid the assimilation of food by supplying vitamine in the form of autolyzed yeast. Endomycin was accordingly given in doses of 10 drops three times a day. This dose was gradually increased until the infant received 50 drops three times a day.

Owing to the rachitic condition the intestinal and other internal secretions were very sluggish, and accordingly laxatives were frequently administered. In the beginning of treatment 1-grain vitaphos powders were given twice a day, later three times a day. This was continued for two months. As the infant's development increased a larger dose was given, until at six months of age 2½ grains were given three times a day. In addition to stimulating the internal secretions, it had a mild laxative effect. After several weeks of treatment a better tone was noted and the general nutrition was improved. Cod-liver oil in 5- to 10-drop doses distressed the stomach, causing eructations and very loose stools. Vegetable juices acted as an excellent restorative. Spinach juice, and later spinach pulp, was given at six months of age, also mashed carrots and baked potato. Orange-juice was given for thirst. One month after this diet was begun the profuse head-sweating ceased, the hard and dry scybalous stools improved, and the vomiting gradually ceased. This treatment was continued about five months.

Eleanor L., born October 24, 1916, was seen by me when five months old. She then weighed 9 pounds and 10 ounces. She had had colitis, jelly-like and long mucous shreds in the stool, and evidences of intestinal catarrh, such as excoriation at the anus, a slight prolapse of the rectum, and the appearance of general emaciation, due to malnutrition. The muscles were soft and flabby, and the infant was not thriving. Skimmed milk was given; later maltose was added. Six teaspoonfuls of spinach juice gradually increased to 12 teaspoonfuls was given daily. After one week spinach pulp was given and whole milk was substituted for the skimmed milk. Baked potato and spinach pulp were alternated daily. Vitamine was supplied by giving 2 grains of vitaphos three times a day. This was continued for one month. The colitis improved after one week's treatment. The infant gained steadily both in appearance and weight. In June, two months after treatment was begun, the weight was fourteen pounds. Two teeth appeared at the age of seven and one-half months, and there has been a general improvement in growth since that time. The vitaphos was gradually increased until, during the third month, 5 grains were given three times a day. It was then discontinued.

Sylvia G. was referred to me by Dr. Harry Goldman with the following history: Forceps case with convulsions soon after birth. Breast-fed eleven months, and weighed at the age of thirteen months 17 pounds. Has always suffered with torpid internal secretions; always had dry scybalous stools. Cannot stand nor talk, and shows no evidence of intelligence. Is backward in both mental and physical development.

Lumbar puncture was performed, and the cerebrospinal fluid examined by Dr. Frederick E. Sondern. His report follows: The specimen consists of approximately 15 Cc. clear fluid without coagulum, but containing a few small fine grayish specks believed to be débris. The cell count is within the normal limits, being 3 per cu. mm. The cysto-count shows the usual mononuclear cells of the cerebrospinal fluid. The globulins are not increased. No organisms of any type can be found.

Because of the peculiar backwardness and the possibility of a tumor in the cella turcica, an *x*-ray was taken. This proved negative, but a thickened condition of the cranial bones was noted. The report of Dr. Wm. H. Stewart follows: Stereoroentgenographic examination of the head of Sylvia G., January 17, 1916, reveals a distinct abnormal thickening of the cranial bones; particularly is this noted in the vertical plate of the frontal bone and in the posterior portion of the orbital and the occipital.

Upon examination of the roentgenograms it can be readily appreciated how a definite

interference with the normal expansion is present. It is this, I think, which gives the peculiar form to the child's head.

The ophthalmoscopic examination showed a pallor of both optic nerves, the fundi otherwise normal.

Lecithin was ordered, one drachm of Fairchild's solution given three times a day. This was continued for over two months with no apparent improvement. One grain of thyroid extract with one-half grain of the pituitary extract was given for the following three months with decided advantage. The stool became more regular and the scybalous character gradually lessened. The general condition, such as circulation, intelligence, and strength, improved. At this time the diet consisted of vegetable puree, such as baked potato, spinach, peas, and carrots. The yolk of hard-cooked egg was given for its fat and lecithin content, and was well assimilated. Dentition, long delayed, made rapid progress; likewise the child, then at the age of three years, commenced to speak and also to walk. Vitaphos had been given in 2½-grain doses three times a day with exceedingly good result. But my greatest reliance in this case has been on the persistent use of the internal secretions and the diet. The child has been a source of considerable anxiety as the prognosis was hopeless from the beginning, and various opinions given all agreed that nothing could be done.

Frances G., born November 27, 1916, was three months old when seen by me. Weighed 5 pounds at birth, 7¾ pounds when three months old. Was premaure five weeks. Had had alternate feedings of breast milk and Nestle's food. The infant was restless, had head sweating, and greenish stools containing mucus and occasionally yellowish-white casein particles. The circulation was stagnant; arms, legs, and face markedly edematous. The urine contained albumin and traces of sugar. Nestle's food was discontinued, and in its place skimmed milk 2 ounces, maltose 1 drachm, and water 3 ounces was given alternating with the breast. This substitute feeding improved the stools and satisfied the infant, but did not increase the weight. Autolyzed yeast (endomycin) was ordered, 10 drops three times a day, and 5 drops more each day until 50 drops were given three times a day. This was continued, in all, about five weeks. The infant appeared brighter and gained in weight. The food was increased ½ ounce more every two weeks until 4 ounces of skimmed milk, 2 ounces of water, and 1½ drachms of maltose were given. At six months the infant was weaned, and whole milk substituted for skimmed milk in the formula. The faulty metabolism of both fat and protein seemed to improve after two weeks of the autolyzed yeast treatment; likewise the gain in weight was steady, the stools became more homogeneous, and contained less mucus and fewer curds.

SUMMARY AND CONCLUSIONS.

When we feed food deficient in vitamine, be that the human breast or cows' milk, such feeding will result in structural deficiency which may remain throughout life. The earliest manifestations and symptoms to watch for are profuse sweating, restlessness, irritability, wakefulness night and day, stationary weight or slow gain, and constipation with hard, dry, scybalous stools showing imperfect digestion. In these stools fat curds and casein lumps can frequently be seen. This class of cases if seen early and the symptoms carefully noted will rapidly improve under the influence of restoratives such as the vegetable juices, especially those containing iron, like spinach, lettuce, salad, Romaine and Swiss chard; also small doses of cod-liver oil, but it must be the pure oil, undiluted, 3 to 5 drops morning and evening, gradually increased. Autolyzed yeast in liquid form, or vitaphos in tablet or powder form, is an excellent restorative. Milk to which is added the crushed yolk of hard-cooked egg, or milk to which several teaspoonfuls of baked potato is added, can be given with advantage to correct the above-named symptoms. Orange juice should be given as early as the second month if these symptoms appear. When they are neglected, then such deficiency diseases as rickets and scurvy in a susceptible body usually result.

EDITORIAL.

THERAPEUTIC LIMITATIONS IN RENAL DISEASES.

It is unfortunate that in the study of chronic renal disease the term "nephritis" should have become practically sanctioned by usage, for the condition which is present is a degenerative process rather than one which is definitely inflammatory. Of course, acute inflammation of the kidneys, or true nephritis, does occur in patients who have had no renal lesions previously, and also may be superimposed upon the chronic degenerative processes to which we have referred. As a class renal diseases of the chronic type give us small opportunity for efficient treatment by means of drugs. They seldom come under observation until the degenerative processes are far advanced, when it is hopeless to expect any method of treatment to restore secreting epithelium which has been destroyed or blood-vessels which have been seriously altered. Our knowledge of the predisposing causes of these chronic changes is also scant, and in many patients there is as much evidence that the disease is secondary as there is that it is primary and responsible for changes in other parts of the body. In acute nephritis it would seem probable that the condition usually clears up if let alone, unless it is so severe as to cause the death of the patient before the inflammation can run its course and subside.

The natural tendency in the presence of disease is always toward the administration of medicaments which it is thought or hoped will be advantageous, but in the various types of nephritis, acute or chronic, it is becoming increasingly evident that our therapeutic materia medica is exceedingly limited, and not only limited, but that many measures heretofore employed may prove distinctly harmful.

In acute nephritis it is customary to administer so-called alkaline diuretics quite freely, including Basham's mixture, yet, when we stop to consider the condition which is actually present in the kidneys, it must be evident that they can do little good. An examination of such kidneys shows many of the Malpighian tufts and tubules are crammed full of red and white cells and epithelial cells. The organ is swollen and hyperemic, and its functional activity may be considered as effectively put aside as is the functional activity of a consolidated lobe of a lung in pneumonia. Nature, under these circumstances, must be given time to carry on the processes of resolution and repair whereby dead cells will be removed and new cells developed, and the free administration of the alkaline diuretics, accompanied, as they usually are, by large quantities of water to increase urinary flow, may result in two conditions which are harmful to the patient. First, the water taken in cannot be eliminated by the kidneys as freely as it should be and so there is a tendency to the production of edema; and, second, the potash salts, which are absolutely innocuous if the kidneys are intact, prove to be powerful depressants if, failing in elimination, they accumulate in the system. Some of the more active diuretics like caffeine, theocin, or theobromine are probably capable of doing actual damage to the kidney by acting as irritants to an organ already inflamed.

It may then be asked, what should the physician do in a case of acute nephritis? It would seem that two or three dry cups over each kidney, with the proper use of hot packs, the administration of purgatives, and the removal of toxic materials by other methods than diuresis should be attempted, that the diet should be largely a carbohydrate diet, and that broths and similar meat extractives be carefully avoided, absolute rest in bed being also insisted upon with the double object of diminishing tissue break-down and preventing congestion of the internal viscera by keeping the surface warm.

In the chronic forms of nephritis, although they are frequently considered together, it is important to recognize that they are widely separated clinically, pathologically, and, for that matter, therapeutically. Disaster comes on apace in the chronic parenchymatous type but is often postponed for twenty years or more in the interstitial type. In the parenchymatous type the proposition is very much like that in acute nephritis. Here we have clinically the same state in the tufts and tubules as to degenerated cells and possibly some red cells. Added to this we have a condition in which the secreting epithelium still attached has undergone degeneration and so is functionally valueless. The greatest danger that can threaten a patient with chronic parenchymatous nephritis is the superimposing of a subacute, or an acute, inflammatory process upon the degenerative condition already present. Because of the scanty urinary secretion in this disease the physician is often tempted to administer stimulating diuretics. It has seemed to us very often that this was not only capable of doing harm, but also that it was about as rational as to think that by pouring oil upon a piece of worn-out machinery it can be made to do its work properly.

The problem in parenchymatous nephritis is not a medicinal one, except as to collateral symptoms, such as high or low blood-pressure, the state of the heart muscle, and toxemia. We can do little for the renal state except diminish the burden of the kidneys by rest, warmth, and the avoidance of food from which come educts which must be eliminated by the kidneys in ordinary health. The free use of Basham's mixture in these cases to overcome the associated anemia and to act as a diuretic fails for the reasons we have given so far, and also because while Basham's mixture may provide the iron from which it is hoped hemoglobin and red cells will be formed, the toxic materials which induce the anemia are still active. In other words, the underlying cause is not removed.

In chronic interstitial nephritis there is polyuria, and, therefore, the temptation to administer the diuretics is not so great, nor is there so much danger of irritating the kidney by the use of stimulating diuretics. In these cases a quiet life, avoidance of worry, proper diet, regulation of the cardiovascular system, and the administration of certain alteratives, particularly if there is a history of syphilis, make up the therapeutic procedures.

Christian has recently contributed another of his papers upon this subject. So sure is he of some of the points which we have mentioned that he goes so far as to state that with the use of stimulating diuretics we have what might be called the therapeutic test to determine whether the edema is cardiovascular or renal in origin. If the edema disappears satisfactorily under treatment, it is almost certainly in whole, or in greater part, cardiovascular in origin. If it fails to diminish there is strong evidence that it is to a considerable degree renal in origin.

Even in cases of renal disease in which the administration of diuretics causes increased urinary flow, this does not necessarily prove, unless edema is present, that their action is valuable. The kidney may let water pass through it without there being a corresponding increase in urinary solids, which, after all, is the most important function of the kidneys, since fluid can be gotten out of the body by the alimentary canal or through the skin, whereas the substances which the kidneys eliminate can be said, from a practical standpoint, to be capable of elimination in no other way except by these organs.

Christian concludes that in uncomplicated nephritis of all types the diuretics are either useless because they are not indicated or because they are incapable of doing any good and may do harm.

Digitalis and caffeine, which are so largely employed, probably do more good by their circulatory effects than they do by their influence upon the kidneys.

THE IMPORTANCE OF ACCURATE DIAGNOSIS IN RELATION TO TREATMENT, WITH SPECIAL REFERENCE TO THE EAR.

The statement embodied in the above heading is so manifestly correct that it would seem to be unnecessary to discuss it. Nevertheless, we believe it to be a fact that, all too frequently, treatment is administered without sufficient care in the investigation of the case, and, as a result, the treatment not only fails, but in many instances causes disaster. Thus, for example, the old haphazard use of digitalis in all cardiac disorders has doubtless destroyed many persons with partial heart-block, and its use in moderate quantities has failed to give the relief which large doses would have given in auricular fibrillation. Of course, it has only been within the last few years that we have been able to differentiate these conditions, but at the present time they are very clearly differentiated. Innumerable instances of a similar nature might be cited.

An article by Bacon, of New York, on the difficulties of making a diagnosis in certain cases of middle-ear suppuration provides, however, the text for this editorial. Bacon, who is an otologist of very large experience, points out that the diagnosis of complications of acute middle-ear suppuration is often most difficult and the symptoms most misleading. Some light can be thrown upon the case in many instances by the use of the *x*-rays, and a careful examination of the patient will possibly clear up a doubtful point, particularly if the examination is repeated. Thus, furunculosis of the external auditory canal may simulate mastoid involvement, and, on the other hand, a mastoiditis due to the Streptococcus mucosus capsulatus may at times present few, if any, clinical symptoms. A bacteriological examination of the discharge may, therefore, be most important both from the standpoint of treatment and prognosis, both the Streptococcus pyogenes and the form just mentioned being most dreaded as causes of infected sinus thrombosis. So, too, if both ears are infected it does not follow that both are infected with the same organism.

An additional point of importance made by Bacon is that the leucocyte count is not likely to be high in adults with mastoid disease, and is much more marked in cases of brain abscess and in sinus thrombosis than in the former condition. It reaches its highest point in meningitis and pneumonia.

It is interesting to note that conditions far removed from the ear may cause the otologist to perform a radical operation in the belief that mastoiditis is present. Thus, in the presence of middle-ear suppuration it may happen that a high fever and all the evidences of acute infection may develop which will lead to the belief that mastoiditis is present, when, in reality, pneumonia has occurred as a complication, or, as in one case reported by Bacon, the patient not only had middle-ear disease but a pyelitis. In this patient there was actual evidence of meningeal involvement to the extent of rigidity of the muscles of the neck. Lumbar puncture was done with a negative result. Both mastoids were operated upon by exploration, but before proceeding to radical measures Bacon had another examination of the urine made and found that it contained a large amount of pus with the Bacillus coli communis, the fever and possibly the meningeal symptoms being due to the pyelitis and not to the middle-ear disease.

We are interested to note that Dr. Bacon is in conflict with some of the modern pediatrists in his belief that the teeth may induce reflex nervous irritation and fever. He cites the case of a baby a year old operated upon for mastoiditis who developed a sudden rise in temperature which caused anxiety until the teeth, which were about to come through the gums, emerged from the mucous membrane.

Lastly, it is important in connection with the subject of diagnosis and treatment to recall the fact that because a patient has one condition this in no way excludes the possibility of his having two or three other

conditions. Too often we are satisfied with a diagnosis of one state and fail to search for complications which may be responsible for many symptoms which are credited to the disease which is first recognized, and which at the moment may be of little importance so far as prognosis and treatment are concerned.

ACUTE DILATATION OF THE STOMACH DURING AND AFTER ANESTHESIA.

When we consider the thousands of patients who receive anesthetics every year and recall how very few of these suffer from acute dilatation of the stomach, we are forced to admit that the complication is in reality very rare. On the other hand, when it does occur it is the cause of very profound anxiety because it not rarely is followed by a fatal termination. The question, therefore, as to the best method of treating this serious complication is of interest to every one.

In some instances it would appear that the dilatation is an indirect effect of the anesthetic, and in others that it is due to the patient's swallowing the ether vapor, which, on its entrance into the stomach, distends this organ mechanically and possibly by its direct action impairs its nervous and muscular mechanism. Without doubt the great majority of patients who take ether into the stomach save themselves by vomiting or belching before paralytic distention develops, but if the distention of the stomach is at all severe, particularly if it takes place while the patient is still under the influence of the drug, such automatic measures of relief fail and the surgeon must resort promptly to efforts which will relieve the stomach as far as possible of its contents.

It is thought by some that active purging of a patient prior to taking an anesthetic tends to predispose the patient to this complication, and without doubt prolonged starvation, induced by disease or ordered as preliminary to the anesthetic, by diminishing vitality my have such an effect. It would seem that the most efficacious effort is immediate and repeated stomach washings, and if the patient survives a sufficient length of time it is to be recalled that his inability to ingest and absorb fluids strongly indicates the employment of hypodermoclysis and possibly also enteroclysis. So fearful are some surgeons of this complication and so confident are they of the value of stomach washings that they invariably employ it after every anesthesia. This, however, is an excessive precaution and often causes the patient great discomfort.

It would also seem probable that posture is an important factor in overcoming the condition. Momentarily putting the patient in a semi-erect or stand-up position may, in cases in which the dilatation has not gone as far as paralytic distention, give relief by enabling the patient to belch. When paralytic distention has actually developed experience has seemed to indicate that the best position is flat on the back with a pillow under the buttocks so as to raise the lower part of the trunk above the level of the thorax. Drugs do not seem to be very efficacious in this condition. Adrenalin has been employed, as have also strychnine and eserine. We have never seen the use of eserine produce good effects, possibly because when it has been tried the patient has been too ill. On the other hand, we have seen it produce ill effects, the patient seeming to go into collapse after its free administration. So far as drug administration is concerned, we believe that strychnine and adrenalin hypodermically probably offer the best result, or, in place of adrenalin, pituitrin. Some of the danger of acute dilatation due to ether can be avoided by the proper administration of the drug. If the drug is pushed when a patient struggles he is very apt to swallow the ether vapor as well as inhale, and, therefore, gastric symptoms, under the modern method of drop anesthesia, are less frequent than they were when older methods were used and when it was customary to push the drug vigorously with what was practically a closed inhaler.

THE TREATMENT OF WAR WOUNDS.

Among the many lessons of the present war of major importance is that to the effect that a contaminated wound, providing it be dealt with promptly, by a well-trained surgeon, need not necessarily become an infected one; that if all the dead tissues be removed swiftly and completely by a sharp knife and the bleeding be checked and tension be prevented in the wound, the slight contamination theoretically remaining will be overcome by tissue resistance, and that the best germicide is this resistance afforded by normal or almost normal tissues. None the less there occur many circumstances and some wounds in which complete removal of devitalized tissue is impracticable and impossible. Nor does it seem unwise to supplement the surgeon's skill by an antiseptic, if such can be found, which, whilst it destroys any remaining contamination, will not devitalize tissue. As a result of the search for such an antiseptic the Carrel-Dakin technique has been evolved; one of priceless value in well-equipped hospitals, and in the hands of those skilled in its use, but of limited application in war surgery, excepting that which occurs at a base.

It is because of the need of a more serviceable antiseptic that Dakin evolved his dichloramin-T, which gives greater promise of military service than any other antiseptic yet proposed, and which in the extensive trial already accorded it by the direction of the Surgeon-General has yielded in the hands of many competent observers, with large clinical material, a high percentage of satisfactory results.

It is in line with the search for an ideal antiseptic that Rutherford Morison (*British Medical Journal*, Oct. 20, 1917) has advocated what is now known as "Bipp," which is made up of bismuth subnitrate 8 ounces, liquid paraffin 8 fluidounces or a sufficient quantity, and iodoform 16 ounces, this forming a paste which should be used sparingly since poisoning may readily occur from both the iodoform and the bismuth. As a result of the use of this paste Morison states that he can treat large infected wounds in such manner that they require no especial drainage, that they can be safely closed by suture at any period of their progress, and that the dressings used for them can be left unchanged for from one to six weeks, the healing in the meantime making steady progress. It is interesting to note that not only Morison himself, but others, have had similar experiences. After observation of the latest convoys sent to the Northumberland War Hospital, he states, about half of them were treated by Bipp, and that all of his colleagues agree that the best results are from its use. Moreover, he asserts that compound fractures of all the bones can now be treated with as great ease both to the patient and the surgeon as simple fractures are. That a through-and-through wound, with small entrance and exit openings, may be generally cleansed satisfactorily by passing a long strip of gauze through it and pulling this to and fro as a first step, next by doing the same with a strip of spirit gauze, and finally depositing a layer of Bipp on the inner surface of the wound by spreading a long strip of gauze with the paste, passing it through the track and rubbing in the medicament by pulling the gauze backward and forward again and again.

Dissecting out the wound he holds to be unnecessary, and in the hands of surgeons who are insufficient anatomists may be dangerous. The most that should be done in this respect is to remove only such portions of tissue as are obviously dead. The drier the wound the better, but some hemorrhagic oozing does not bar success.

The fresher the wounds are the better they react to Bipp. Morison states that he has now closed several of these wounds without tube or other drainage than is allowed for between interrupted sutures, not too close together. From this the bacteriologist has cultivated the Bacillus perfringens, tetanus, and a variety of other anaerobic organisms, but the results have always been good. A favorite suture is thick sterile dry silk, rubbed all over with Bipp. As a rule the suture is left in for three weeks. After the first dressing has

been removed, if the wound is clean, granulating and superficial Bipp is discarded in favor of the ordinary dressing.

In making Bipp, bismuth and paraffin are sterilized by dry heat at a temperature of 120° C. for half an hour; the bismuth after cooling is mixed with the iodoform in a mortar which has been sterilized by means of boiling water and formalin. The paraffin is added to the mixture at a temperature of 90° C. and thoroughly mixed, then put into specially made collapsible tubes, with nozzle ends, holding 40 to 80 grammes. The paraffin used should be semisolid, odorless and tasteless, melting point 45° C., free from acidity and carbonizable organic impurities. Bismuth, of course, must be chemically pure and free from arsenic. In sterilization the temperature must not rise too high.

As to the technique, under an anesthetic the wound is covered with gauze wrung out in 1-to-20 carbolic acid. It is then opened freely until its bottom is exposed, cleansed with dry sterile gauze mops, Volkmann's spoon, etc., with removal of all foreign bodies; mopped with methylated spirit and dried and filled up with Bipp rubbed in well by dry gauze, all excess being removed. The wound is then dressed with sterile gauze and covered with an absorbent pad, which is held in position by sticking-plaster and a bandage. This dressing may be left on for days or weeks. The patient is free from pain or constitutional disturbance. Should discharge come through, the stained part must be soaked in spirit and a gauze dressing wrung out of the same applied as a further covering.

In this relation it is worthy of note that Sir Berkeley Moynihan spoke of Bipp in high praise, but qualified his observation to the effect that in an inspired moment whilst operating, and reflecting upon how little Bipp was required, he decided to use none of it and found his results equally good.

Under the general subject of antiseptics, Short, Arkle and King report on wound treatment by brilliant-green paste. Their feeling toward Bipp is not entirely friendly. They think it may delay healing, and they report a case of unnecessary operation to remove iodoform from a hole in a tibia, suggesting in the skiagram a metallic fragment, and they observe that the application is at times poisonous. The paste they advocate, introduced by Captain Hey, consists of brilliant green, French chalk, and liquid paraffin, which they hold at least does no harm since it is not poisonous, though they observe that symptoms of boric acid poisoning should be watched for. It is painless; it will sterilize a wound in three days. The wound need only be dressed once in four days. No permanent residue is left to interfere with immediate healing. Every part of the wound should be dry and not bleeding. The paste should be rubbed in thoroughly. By this method they have been able with fair constancy to obtain union of compound fracture even when complicated by joint injury, big buttock wounds, and deep muscle wounds. They have excised an elbow-joint full of pus, and obtained primary union in a fortnight.

The usual procedure is to stain the track of the missile, excise and paste it, and either leave it open or insert a few central sutures. On the third or fourth day a smear from the deepest part of the wound is taken. When the B. perfringens is absent, as is almost invariably the case, and the organisms are not more than six to the field, they completely close the wound by secondary suture.

Hey's method of staining the wound by injecting through a Carrel tube with a 1-in-200 watery solution of brilliant green is a very valuable aid to complete excision.

Gray, as the result of work in several casualty clearing stations, concerning the effect of liquid paraffin on wounds in different stages, states that this liquid has, almost without exception, a very beneficial action on the walls of a wound and on the tissues adjacent to it. It prevents development of the symptoms of inflammation in these parts and will cause such symptoms to disappear rapidly if they are already present. The skin remains or becomes normal in appearance; redness and swelling do not develop, or, if present, disappear. Pain is

assuaged. Performance of function becomes easier, although, of course, this is frequently restrained by therapeutic agencies and is therefore not evident. Changes of dressings are comparatively painless.

Liquid paraffin is not antiseptic in the ordinary sense of the term. If a wound be "packed" with gauze wrung loosely out of the paraffin, it is found that in two to four days the discharge in the wound swarms with organisms, although the surrounding parts are free from inflammation. The "wound" with the fluid part of its contents may be likened to a test-tube containing nutritive medium in which organisms are thriving. In either case the addition of antiseptic will lessen or entirely inhibit the growth. If an antiseptic is dissolved or suspended in the liquid paraffin with which the gauze pack is saturated, it is found that the wound remains or becomes sterile. Various antiseptics or mixtures of antiseptics have been used, with good effects in all cases, although these effects vary, possibly owing to selective effect of the particular antiseptic against the particular organism or to tolerance acquired by the organisms for the antiseptic employed against them. Those chiefly used up to the present are flavine, brilliant green, boric acid, and iodoform. It is rather difficult to justify preference for any one. A combination seems desirable. Non-poisonous antiseptics with more or less prolonged action when in contact with body fluids are likely to be most successful. It seems that, although the effects of microörganisms on the tissues adjacent to a wound are inhibited, absorption of chemical antiseptics from the wound may occur and cause symptoms of poisoning.

It has been found that paste made with other substances than paraffin—for example, gums—is of inferior curative action. It is to be noted that whatever the antiseptic the fundamental treatment of the wound in the hands of those who are successful is invariably wide opening and free excision of dead parts. It is fair to assume that the major beneficial effect noted in recent surgery is incident to this underlying factor rather than to any particular antiseptic.

ON THE SYMPTOMS OF NEPHROLITHIASIS.

To those who have followed the literature of this subject, and particularly the comparatively recent writing of Cabot, the thought is fairly familiar that typical symptoms and signs of kidney stone may be elicited in the absence of this as an underlying condition; and that kidney stones, though present, may fail to give any symptoms recognized as characteristic, may have all symptoms referred to the gastrointestinal tract, or may give no symptoms at all.

O'Neil (*New York Medical Journal*, Nov. 10, 1917) has made a study of 371 cases from the records of the Massachusetts General Hospital, these running as far back as October, 1911. He notes that practically all stone cases have a history of pain in the loin, groin, or abdomen, sometimes referred to various regions; described as dull, grumbling, acute, knife-like, or colicky. The urinary symptoms are by no means constant. In some cases hematuria was the presenting symptom. At times costovertebral tenderness was present; spasm of back muscles or of abdomen, tenderness over appendix, kidney, gall-bladder, or urinary bladder were frequently noted.

A typical picture of severe colicky pains beginning in the back and radiating to the testicle was by no means common. Considering the value of the symptom of pain O'Neil believes there is no definite type, and the pain of lithiasis can be simulated by or simulate a great variety of intra-abdominal conditions as well as other urinary lesions, as is well illustrated by the series of thirty-two cases admitted to the house with typical symptoms of lithiasis definitely proved to have other conditions.

Pain, or the history of pain, was present at some time in practically all cases of calculus. That it may be remote and forgotten is shown by the absence of pain for

a long time, as in the case of large, silent calculi discovered in the course of routine examination.

As contrasted with the pain characteristic of orthopedic conditions, that incident to hypertrophic arthritis or tuberculosis shows stiffness, change of position, or muscular spasm. Moreover the pains are of a referred type and can be produced by some distant motion. Pain in general relaxed positions is much less definite. Urinary symptoms may be associated with this type of pain, and they, as well as the pain, are relieved by position, support, and removing weight. It is fortunately true from the diagnostic standpoint that the great majority of cases of lithiasis present an abnormal urine. Its detection may require repeated examinations. The writer regards the *x*-ray as the most valuable single method of diagnosis. He states that with good technique, multiple exposures, and good preparation few stones will escape. Dr. Percy Brown found that 96 per cent should be positive. As for ureteral catheterization the function of the kidney containing a calculus is generally diminished. Scratches on a wax catheter passed carefully are of great value when the *x*-ray is negative. As for physical examination, not infrequently the healthy kidney is a tender and palpable one. It is held that a persistently normal urine with persistently negative *x*-ray in connection with a renal calculus causing pain in the lower back or abdomen must be a very great rarity.

REPORTS ON THERAPEUTIC PROGRESS.

THE TREATMENT OF GOITRE WITH QUININE AND UREA INJECTIONS.

In the *New York Medical Journal* of September 22, 1917, WATSON reviews the record of 125 goitre patients and reports his results from the use of quinine and urea injections. This treatment for hyperthyroidism was first reported in the *Journal of the American Medical Association* for January, 1914, and further considered in the issue of September 25, 1915. In 43 per cent of the patients no exciting cause could be elicited; in the remaining 57 per cent the onset could be ascribed to a definite exciting cause. Of the 125 cases, 15 per cent was caused by worry; parturition was responsible for 11 per cent, and in 9 per cent the condition was due to puberty. Twenty per cent gave a family history of goitre and 11 per cent of nervousness; 19 per cent had had tonsillitis. Forty-five per cent of the exophthalmic patients first noted the goitre eight years before examination at the aevrage age of thirty-four years, and the symptoms developed at the age of forty. Fifty per cent gave a history of acute onset, two years before coming under observation, at the average age of twenty-nine years. Sixty per cent of the non-ophthalmic patients observed that they developed more marked symptoms of intoxication as the goitre became more chronic.

Before coming under treatment, five exophthalmic patients had had ligation of the superior thyroid arteries with temporary relief; four had had partial thyroidectomies without permanent benefit; three had had pelvic operations without lessening the hyperthyroidism; the condition of one was aggravated by a panhysterectomy; and one had had a tonsillectomy six months before without influencing the severity of the exophthalmic symptoms. Enlargement usually begins in the right lobe, sometimes in the isthmus, and less frequently in the left lobe. In 95 per cent of the exophthalmic patients of this group both lobes and isthmus were involved before the goitre became exophthalmic. A majority of the patients noticed increasing symptoms of intoxication as the goitre became more chronic, gradually involving both lobes and isthmus. Eighteen per cent of the mildly toxic patients became exophthalmic after an average period of five years. This study indicates that both non-toxic and toxic

goitre occur later in life in non-goitrous localities than in sections where the disease is more prevalent.

The following tables show the results after quinine and urea injections:

Effect of the Injection on Symptoms—	Relieved.	Improved.	Not Improved.
Exophthalmic.....85	(aver. 4 mos.)	15	0.
Non-exophthalmic.84	(aver. 2 mos.)	10	6

Effect of the Injections on Goitre—	Cured.	Reduced.	Not Reduced.
Exophthalmic.....80	(aver. 5 mos.)	15	5
Non-exophthalmic.75	(aver. 4 mos.)	12	13

Two patients suffering with severe toxic goitre with exophthalmos of several years' duration received only slight benefit; later a lobectomy was done without additional relief. Four exophthalmic patients were pregnant two to four months. Relief from hyperthyroidism followed the injection, and they went to term without recurrence and had normal deliveries. The number of patients cured is highest in the group of those who came for treatment early in the disease; the benefit received by those who came later was in proportion to the degree of damage done the circulatory and nervous systems. A goitre that has once disappeared has never recurred. A majority of the patients in this group have been under observation for two to four years. The quinine and urea injection has limitations as has any other treatment for goitre, and can be employed only in selected cases. The treatment of the exophthalmic type in young adults is very difficult, and should be attempted only under the most favorable circumstances. If the best results are to be secured, hyperthyroidal patients must have at least a year of mental and physical rest after treatment.

CHRONIC HEART-BLOCK.

In the *American Journal of the Medical Sciences* for October, 1917, BLACKFORD and WILLIUS reach these conclusions:

1. Alpha iodine, a derivative of thyroid gland, quickens the idioventricular rate in complete heart-block. This is followed by marked subjective relief to the patient. The drug must be pushed to the tolerance of the patient and the dose then reduced to the largest amount that can be taken without discomfort. The auricular rate increases much earlier and to a much higher figure proportionately than the ventricular rate.

2. In nine cases of complete heart-block eight patients gave evidence of definite valvular disease, mitral disease predominating. The ninth patient had advanced nephritis.

3. In none of these nine cases was there a probable venereal etiology.

4. Six of the patients gave a history of probable etiological infections with the streptococcic group—*i.e.*, chronic arthritis (one case), la grippe and tonsillitis (five cases). Diphtheria seems to have been responsible in two instances. The ninth patient did not give a history of previous infection on careful inquiry, but at autopsy a large mulberry calcified nodule was found involving the bundle and one cusp of the aortic valve. No other pathology was evident.

5. Digitalis should be used in all cases of chronic heart-block in which there is evidence of myocardial insufficiency.

6. Blackford and Willius do not know the effects of long-continued administration of large doses of alpha iodine in patients not suffering from thyroid insufficiency. Therefore they believe that for the present this medication should be used only to relieve the Stokes-Adams syndrome in chronic heart-block.

THE TREATMENT OF GASTRIC HYPERACIDITY AND HYPERSECRETION

Boos in the *Boston Medical and Surgical Journal* of October 4, 1917, states that the dietary directions for hyperacidity and hypersecretion are the same whether the cause is external or neurogenic. The patient's food should be carefully indicated by a list. In order that his stomach be never quite empty, he should have five or six meals a day, instead of three. He must take sufficient time to eat his meals, and he should rest after each main meal. On account of the possibility of hypermotility,

the food should contain plenty of butter, which retards the emptying of the stomach. To reduce the supply of hydrochloric-acid-forming material, his diet should be made as nearly salt-free as possible. Sweets stimulate the flow of HCl, therefore they should be prohibited. As regards the diet list, Boos finds that his results are more satisfactory if he enumerates the things the patient may or may not have at each meal, rather than to indicate in a general way what he may eat and what he must avoid. The following is a sample:

Breakfast (7.30 A.M.): Baked apple with cream; eggs, boiled, poached, on toast, shirred or scrambled; grilled bacon; steak or chop; Bensdorp's cocoa; occasionally one cup of coffee with much milk; buttered toast or crisp rolls.

10 A.M.: A glass of good, rich milk with bread and butter or zwieback.

Luncheon, 1 P.M.: Boiled rice or farina with cream or milk; a cup of custard or milk toast; crackers with milk; green vegetables with mashed or baked potatoes; macaroni cooked with cheese; spaghetti; broiled, creamed, baked or boiled fish (no mackerel, salmon, or bluefish); occasionally cold meats; potatoes baked in their jackets with Parmesan cheese; fish chowder; oyster stew. With any of these luncheon dishes, bread and butter or buttered toast. Daily, baked apple with cream, stewed prunes or apricots, apple sauce.

4 P.M.: A glass of good, rich milk with bread and butter or zwieback.

Dinner, 6.30 P.M.: Oysters on the half-shell, from November 1 to March 31, only; chowders (except clam chowder). Fish: as at luncheon. Meat: Fowl, game, veal, beef (rare), steak (rare), lamb, very mild ham. The meats should be prepared in simple style, without fancy sauces and without spices. They should be roasted, broiled, stewed, pot roasted. Tender boiled beef and fowl are allowable. Vegetables: Young carrots, peas, beans, cauliflower, mashed turnips, asparagus tips, squash, summer squash, spinach in French style, lettuce, cooked like the spinach (very delicate), egg-plant (not fried), oyster plant (not fried). Vegetables should be cooked with plenty of butter. When fresh vegetables are not available, the good brands of canned vegetables form a perfect substitute. Potatoes: Baked, boiled, au gratin, mashed or creamed. Macaroni, rice, spaghetti, noodles. Green salads with plenty of oil and little vinegar. Weak tea. Soft crackers and a little mild cheese. Puddings are allowed, except plum, suet, steamed, or any other heavy puddings. Fruit and wine jellies are allowed; also ice cream, but it must be eaten very slowly, melting it in the mouth. No pies, pastry, or fritters.

9 P.M.: A glass of good, rich milk.

In general: No raw or fried onions, no radishes, garlic, horseradish, ketchup, chutney, Worcestershire sauce, pickles, curry, olives, mustard. Avoid hot or fresh bread. Do not eat fried or salty food but use just enough salt in the food to make it palatable, no more. Little or no sugar in the food. No candy. Rest for half an hour or longer after each main meal of the day, lying on the right side. Take regular exercise, such as walking, swimming, doubles in tennis, golf, horseback riding, bowling (in winter).

Eat slowly. Chew the food well. Go to bed early. Do not read novels at night. Stop worrying. Keep the bowels regular. Take a tepid sponge bath in the morning.

Milk is given between meals, because the proteids in it absorb much pepsin-hydrochloric acid, while the butter-fat delays emptying of the stomach. The use of some alkaline water at meals or immediately after is advisable in all cases, and French Vichy is good for this purpose. A glass of Vichy or simply of hot water on an empty stomach also helps to relieve the morning distress of hypersecretion by diluting the acid contents of the stomach.

This dietary regimen is suitable also for cases of gastric ulcer with hyperacidity, but ulcer patients must be warned to avoid, in addition, foods leaving a coarse residue, such as cabbage and most greens, as also raw fruit like apples, pears, pineapple, etc., and nuts and raisins.

As Boos has stated, many cases of hyperacidity, due merely to external causes, will

gradually yield to the regimen alone, but improvement is, of course, more rapid if the patient receives medicine from the start. Hyperacidity of neurogenic origin always requires medicines.

In the medicinal treatment of hyperacidity, preparations containing proteolytic ferments, such as pepsin, papain, and pancreatin, have been much in vogue. The use of these ferments is, to his mind, however, quite irrational, since in cases of this kind the pepsin is already present in abnormal amount. The gastric juice of the patient with hyperacidity contains not simply excessive hydrochloric acid, but excessive pepsin-hydrochloric-acid; in other words, the pepsin is increased in the same measure as the hydrochloric acid, with the result that digestion is really more vigorous than in the normal individual. What these patients need is neutralization of the acid, with consequent relief from its irritant action on the gastric mucous membrane. Bicarbonate of soda gives this relief very promptly, but its neutralizing effect does not last long, since this salt, being soluble, is carried out of the stomach by peristalsis before the excessive acid formation has ceased. In order to obtain more lasting neutralization, it is necessary to use insoluble compounds, such as carbonates of magnesia and lime, and the oxides of magnesium. These substances are precipitated among the rugæ of the gastric mucous membrane, where they remain to neutralize the hydrochloric acid as it is formed. They are removed from the stomach only as they are converted into their soluble chlorides. Boos finds that in nervous hyperacidity with a tendency to loose bowels carbonate of lime develops a threefold action: it neutralizes the excess of acid, it stops the looseness of the bowels, and the absorption into the system of the calcium chloride which is formed in the stomach produces a distinct quieting effect on the patient's nervous condition.

In practice Boos has used for many years a mixture of calcium carbonate and magnesium carbonate or oxide in form of a powder, the quantity of each depending upon the state of the patient's bowels. This powder answers the purpose very well, but occasionally patients complain of the inconvenience of taking powders, particularly when they are away from home.

For hyperacidity, he has the patients take one powder t. i. d. from 30 to 50 minutes p. c. If their symptoms occur earlier—*i.e.*, while they are still eating, or immediately after eating—he has them take a little bicarbonate of soda just before the meal. For the morning headache of hypersecretion he advises them to take another powder when they go to bed.

CO-OPERATION BETWEEN PHARMACOLOGY AND THERAPEUTICS.

The *Journal of the American Medical Association* of October 6, 1917, contains an address on this subject by HEWLETT. We have dwelt on it frequently in leading articles in the GAZETTE. He well says that one of the most important methods for helping to bridge over the gap between animal pharmacology and practical therapeutics is the accurate study of the effects produced when drugs are given in the usual medicinal doses to human beings. The methods employed in making such studies must naturally be free from the possibility of doing harm. Fortunately a great variety of new methods have been developed in recent years which may be applied to the study of human functions. Without attempting to name all of these, Hewlett mentions the following: blooodless determination of the arterial and venous pressures; graphic records of the gastric contractions, of the arterial and venous pulse waves, and of the electric changes accompanying cardiac activity; roentgenographic examinations of the alimentary tract; determinations of the rate of metabolism; chemical analyses of the alveolar air, of small quantities of blood and of excreta, and estimations of the various immune bodies in the blood. Each new method that can be applied to the study of human functions not only advances our knowledge of these functions and of their perversions in disease,

but also makes possible more accurate studies on how these functions are influenced by various remedial measures. In many cases such studies can be carried out on normal individuals, and within a short space of time sufficient data can be accumulated to establish with scientific accuracy certain aspects of drug action.

Ultimately, however, we must answer the question: Are these drug effects of value in combating the disturbances of functions that are encountered in disease. The final answer to this question can seldom if ever be given from studies either on normal animals or on normal men. In certain instances the diseased function is unusually susceptible to drug action. The body temperature of a febrile patient, for example, is reduced more easily by antipyretic drugs than is the body temperature of a normal person. Digitalis in therapeutic doses has relatively little effect on the heart-rate when this is controlled in the usual way from the sinus region. Its reputation for slowing the heart of patients is based almost exclusively on observations which were made on those suffering from auricular fibrillation. Diuretics of the caffeine group produce a moderate diuresis in the healthy man, and may be ineffective or harmful in nephritic edema, whereas in cardiac edema they often cause a veritable flood of urine. The dilatation of the bronchi produced by epinephrin is most plainly demonstrable in conditions of bronchial constriction, whether produced experimentally or occurring during asthma. Finally, the treatment of infections can manifestly be tested only on infected animals or human beings.

Not infrequently the remark is made that the value of a therapeutic measure is determined solely by clinical experience. While Hewlett has no desire to contradict this assertion, it is pointed out that ordinary clinical observations are often extremely difficult to interpret, owing to the vagaries of disease and to the many remedies that are so commonly employed in a single case. The past history of therapeutics warns us that in order to avoid error we need as much assistance as possible from every source. Pharmacology may not, indeed, answer therapeutic problems directly, but at least it aids in their solution. It shows how drug action can be made the subject of accurate study, and the critical attitude which it adopts must be carried over into the interpretation of therapeutic results, if progress in that subject is to be placed on a firm foundation.

On the other hand, pharmacologists could, Hewlett believes, be of greater help to those who work in the clinic if they would fully realize how their results may be given a form more suited to clinical needs. What, for example, is the effect of a given drug in small doses, especially when administered over a long period of time? How are the effects modified when animals have been made the subject of disease? What pharmacologic problems can be studied on man himself, and especially on patients who are taking the treatment usually given for their disease? Work on such lines as these, whether by pharmacologists or clinicians, will help to maintain contact between the science of drug action and the art of treatment.

THE PULSE-PRESSURE TEST IN PREOPERATIVE ESTIMATION OF THE RESERVE STRENGTH OF THE CARDIOVASCULAR SYSTEM.

In the *American Journal of the Medical Sciences* for October, 1917, CASHMAN describes exercises whereby the circulation is tested and says that the chief value of these tests is in the cases in which the force and rhythm are regular or but slightly irregular, the type of case in which the ordinary methods of examination do not throw light on the condition of the curculatory apparatus, and the type of case in which surgeons are so liable to blunder. Cashman feels that this test signifies the ability of the cardiovascular system to respond to strain at the time the test is made, and that it does not signify what portion of the cardiovascular system is at fault. The condition may be due to a permanently damaged heart muscle or cardiovascular

system, which is working with very little reserve and which may fail if subjected to sudden strain. On the other hand the condition may be a temporary one, due to toxemia, exhaustion, or fatigue, but nevertheless this is the type of case that should not be subjected to additional severe strain. How frequently we find women who are worn out from multiple pregnancies, toxemias, and chronic infections suffering from chronic fatigue and exhaustion. If the histories of these patients are gone into carefully, we find that they tire readily, suffer from dizziness, dyspnea on exertion, weak spells, or slight swelling of the feet and ankles, although the heart appears to be normal by the ordinary methods of examination. These are the patients who have a stormy convalescence after abdominal section.

Increased pulse-rate and flabby tissues usually attract our attention on physical examination. Low blood-pressure, varicose veins, and acrocyanosis are often indicative of subnormal tissue tone. The association of this condition with prolapse of the uterus, gall-bladder disease, and fibroids is sufficient to attract attention. Cashman has found that many of these patients improve and become fairly good surgical risks after a prolonged rest in bed, and their condition is due to fatigue, apparently, or at least this makes up a goodly portion of the handicap regardless of the secondary causes. In certain cases the damage is apparently permanent and the improvement under rest is slight.

One of the surprising results of this work to Cashman is the frequency of this condition, when one is on the lookout for it, in stout women of middle age, the type that are afflicted with gall-bladder disease, prolapse of the uterus, and fibroids, and he is convinced that many of the deaths that occur one, two, and three weeks after operation in this type of patient and are attributed to embolism and various causes are in reality due to circulatory complications, many of which could be avoided by more careful preoperative study of the patients.

If the preoperative apprehension, the expenditure of energy due to rapid forced breathing, rapid pulse-rate, struggling and loss of heat and fluid as a result of the ether drive, the operative trauma and hemorrhage, and the postoperative pain and discomforts, be compared to the strain of a cross-country run we have analogous conditions. If subjected to a long cross-country run these handicapped patients would fall from exhaustion or die. Unfortunately, under anesthesia, we can carry these patients, unable to make a protest, so far beyond the exhaustion stage that there is no comeback.

Patients with little reserve and who respond so poorly to light strain should be subjected to neither a severe operation nor a cross-country run as an elective procedure.

HEAT STROKE.

In a report of one hundred and fifty-eight cases from Cook County Hospital, Chicago, GAUSS and MEYER state that all patients with a temperature of 103° or over were immediately placed in a tub of tap-water, the level being high enough to cover the body except the head, which was supported in a hammock packed with ice. Vigorous friction was applied to the entire body by four or more persons; ice was freely added to the water, the friction being constantly maintained; the temperature was taken rectally every minute. When the temperature reached 102° the patient was removed from the bath, wrapped in sheets or blankets, and returned to the ward. Generally 102° was reached in ten to thirty minutes. When the patients were returned to the wards their temperature usually continued to fall, frequently reaching subnormal, 95° to 97°. Cardiac stimulants were given freely, strychnine, sodium, caffeine, benzoate, digitalis, strophanthus; an ice-bag was placed at the head and chipped ice was given by mouth. For subnormal temperature external heat was applied. For recurrences in temperature up to 103° cold packs and alcohol sponges were given; above 103° the patient was again given a

cold-water friction bath. It was observed that recurrent temperatures could not be reduced as easily as the initial high temperature, and in a few instances the temperature continued to rise in spite of prolonged friction in cold water. For restlessness and convulsions sedatives were used: morphine, chloral hydrate, scopolamine, the bromides, and mechanical restraints.—*American Journal of Medical Sciences,* October, 1917.

THE EFFECT OF DIGITALIS IN HEART DISEASE WITH THE PULSUS ALTERNANS.

WINDLE in the *Quarterly Journal of Medicine* for July, 1917, states that in aged patients who once show the pulsus alternans it can be certainly said that it will never again be absent for long; although it may be abolished for a time under digitalis, as the result of slowing of the heart and lessened calls on its strength from restoration of tonicity, yet if the rate of the heart be again quickened, or if it be subjected to additional strain, as, for example, by exertion sufficient to induce breathlessness, the pulsus alternans is invariably reinduced; moreover, as said, it will inevitably recur in the course of the illness whatever means of treatment are adopted, and however favorable the patient's circumstances may be.

These results are to be expected from the fact first pointed out by Mackenzie, namely, that the combination of arterial disease and the pulsus alternans signifies severe degeneration of the heart muscle; although this may be for a time covert, and the pulse the only evidence of unsoundness of the heart, the condition is permanent and progressive and cannot be cured or retarded by drugs.

In cases of valvular heart disease of rheumatic origin with the pulsus alternans, the circumstances under which alternation in the pulse ensues are different in this respect, that it is never the first manifestation of an unsound heart, as it is in the aged with cardiac and arterial sclerosis; it supervenes only in patients who are already the subjects of severe heart failure, and it signifies not the condition which is the primary cause of the heart failing, but a superadded embarrassment to the circulation. As a rule it first occurs coincidentally with increase in dilatation, the onset of dropsy, or other conditions which it is unable to meet by full contractions. If the work of the heart is eased, by restoration of its tone, the disappearance of dropsy, and so forth, then the pulsus alternans ceases, and may remain absent so long as the factor which was its immediate cause continues in abeyance.

These considerations explain why alternation in the pulse is not usually persistent from the beginning to the end of rheumatic cases, and perhaps also why it is not so readily reinduced after its abolition under digitalis treatment as it is in the degenerative heart lesions of the aged.

Since this first paper was written in 1913, Windle has continued to use digitalis in heart disease with the pulsus alternans. He has now given the drug to over 100 cases in all, and the results call for no material modification of the statements made in that paper.

PAIN IN THE ARM: SUBDELTOID (SUBACROMIAL) BURSITIS.

To the *Journal of the American Medical Association* of October 13, 1917, BRICKNER contributes a valuable article on this subject. He is not inclined to place much confidence in electricity, baking, violet ray, internal medication, or even massage. It is true, no doubt, that patients have recovered by reason of such measures, or in spite of them. On the other hand, most of the patients referred to Brickner have abandoned these treatments because their symptoms were unrelieved or even aggravated by them.

His first object in the management of subdeltoid bursitis is to overcome the abduction disability, the spasm (if there is any), and thereby, to a large extent, the pain. This he does by a simple automatic

abduction method. He puts the patient to bed supported on several pillows and with his arm raised as far as he comfortably can abduct it. A towel or bandage sling is passed from the wrist or elbow to the head of the bed, and this end of the bed is raised on blocks or chairs. It will often be noted that as soon as the patient is comfortably recumbent he can abduct his arm more than when standing. As he gradually slides down in bed his arm correspondingly goes up; and it is no rare experience in a patient who has not abducted his arm more than 45 degrees in many months to find it thus fully and painlessly abducted in twenty-four hours. Usually it takes a few days longer. If the patient cannot sleep with his arm in this sling, or cannot maintain that position continuously, he may intermit this gradual traction. Codeine and acetyl-salicylic acid are helpful aids in overcoming the pain the first day or two. When passive abduction is thus fairly secured, active abduction is restored with it, and the pain soon disappears also in most cases. The abduction is maintained, and internal rotation is secured by after-treatment with Indian club exercises.

This plan of treatment is equally applicable to acute, "hyperacute," and chronic cases. It is of little or no value in chronic cases with no loss of motion. These cases, in which pain is the only symptom, are, in Brickner's experience, the most difficult to cure. Fortunately, the patients usually recover spontaneously.

He has come to the belief that most patients who have subdeltoid bursitis recover under this plan of treatment in bed with automatic abduction, or the trouble subsides spontaneously, though slowly. There are some, however, that do not thus recover and some that, though they may eventually do so, meanwhile suffer so much pain, loss of function, and interference with occupation that operation is to be recommended as a means of prompt cure. Brickner would therefore advise operation in the following cases: (1) In the chronic form with exacerbations. These patients have been through all sorts of treatment for years; their sufferings during the periods of exacerbation are severe; they show no tendency to spontaneous recovery. (2) In acute, "hyperacute," and chronic cases in which the automatic abduction in bed fails to restore function and to relieve pain and spasm.

The operation Brickner employs he has previously described. It consists in splitting the deltoid; raising the outer wall of the bursa from the inner and incising it; dividing all adhesions in the bursa; incising and retracting the floor of the bursa; removing the deposit, if extratendinous, and suturing any tear in the supraspinatus tendon; or incising the tendon wherever indicated by the roentgenogram and excising the deposits with surrounding tendon fibers, and reuniting the tendon with chromicized catgut (if the defect is not too large); suturing the floor of the bursa with a fine running catgut stitch; anointing the interior of the bursa with a thin layer of petrolatum; suturing the outer walls of the bursa; suturing in layers, without drainage, the deltoid muscle, the deltoid fascia, and the skin; abducting the arm in plaster of Paris for about a week.

The petrolatum may not be important. The reconstruction of the bursal walls is not essential, but it aims at an anatomic operation. The abducted position is also not essential, but Brickner believes that it shortens the after-treatment, which consists in Indian club exercises and other devices to restore internal rotation and full abduction.

All the patients thus operated on have been promptly relieved of pain and early restored to full activity. In only one patient, a physician, was there any complication—a brachial phlebitis which retarded his recovery a few weeks.

In one case of chronic bursitis without any lime deposit, in which the pain and disability continued, with exacerbations, for years, division of the adhesions and abduction for one week were followed by permanent cure. This is the only case without lime deposit in which Brickner has operated. It illustrates, first, that the roentgen-

ogram of a deposit is not essential to a diagnosis of subdeltoid bursitis, and, second, that division of the adhesions (and placing petrolatum in the bursa) will effect a cure when conservative measures fail, even in the absence of the lime mass.

TREATMENT OF ENTAMŒBA HISTOLYTICA "CARRIERS" WITH EMETINE-BISMUTH-IODIDE.

In the *Lancet* of September 15, 1917, LILLIE and SHEPHEARD reach these conclusions, which they think may be drawn from the facts which they present in the body of their communication:

1. (*a*) That "carriers" of *E. histolytica* who had not had any injections of emetine hydrochloride were cured to the extent of 78 per cent by two courses of the salol-coated emetine-bismuth-iodide pills. (*b*) In the case of men who had had emetine injections 72.8 per cent were cured by two courses of the salol-coated pills. (*c*) In the case of men who had not had emetine injections 70 per cent were cured by two courses of the keratin-coated tablets. (*d*) In the case of men who had had emetine injections 45.4 per cent were cured by two courses of the keratin-coated tablets.

The difference between the percentages in (*a*) and (*b*) are within the range of experimental error and need not be considered. But in (*c*) and (*d*) the difference is too great to be ignored. This difference may be due to variation in the quality of the keratin-coated tablets, but such a defect would be common to both cases which had received injections of emetine and those which had not. It is generally admitted that certain "carriers" of *E. histolytica* are not cured by emetine in any form, and it may be, as Mr. Dobell suggests, that these cases become segregated in (*d*). It seems possible that the difference in the two percentages may be due to the injections of emetine rendering the "carriers" less liable to be cured by emetine-bismuth-iodide.

For comparison with the above percentages of cures by a maximum of 72 grains of emetine-bismuth-iodide carried out in the special ward Lillie and Shepheard give the number and percentage of cures in the other wards of Mont Dore Military Hospital. The number of grains of the compound which these cases received varied from 36 to 200. A case was regarded as cured after not less than five negative examinations over a period of not less than five weeks after the end of treatment. The last test was made at the Barton Convalescent Depôt. Out of 160 cases treated 142 were cured—*i.e.*, 88.7 per cent.

2. There is no evidence that the length of time between the dates of onset of dysentery symptoms and the treatment has any effect upon the chances of cure by emetine-bismuth-iodide.

3. There is no ground for the belief that the vomiting diminishes the chance of cure by this treatment. There is nearly as much vomiting among the cases which are cured as among those which relapse.

4. The age of the patient has no effect upon the chance of cure by the drug. But there is evidence to show that men over forty years of age vomit less while undergoing treatment.

5. The salol-coated pills are a distinct improvement upon the keratin-coated tablets from a curative point of view. They also cause less vomiting and loss of weight.

THE NUTRITIVE VALUE OF BEER.

That the direct food value of beer counts for little is borne out by an interesting investigation carried out by J. S. Sharpe in the department of physiology, Glasgow University, the results of which are published in the August number of the *Biochemical Journal*. It cannot be denied that the alcohols, sugars, and dextrin have a certain value as sources of energy, but even if we reckon that the total nitrogen found is present as nutritive material still the amount is insignificant. But, as Mr. Sharpe shows, it is a mistake to assume that all the nitrogen present is in the form of protein. As a matter of fact, the protein nitrogen of the beers he analyzed varies from only 13.2 to 37 per cent of the total

nitrogen—that is to say, the protein content of beer varies from 0.038 to 0.185 per cent, quite insignificant figures. In regard to the further distribution of nitrogen in beer, the amino-acid nitrogen varies from 0.014 to 0.040 per cent, nitrogen in purins from 0.010 to 0.039 per cent, and amounts due to other substances as alkaloid and bases are quite negligible.

These results are of interest, especially in view of the report of the Committee of the Royal Society on the Food Supply of the United Kingdom, which stated that the nitrogen compounds of beer have been little studied. So incomplete is our knowledge of their nature that this committee did no more than assume that something between 50 and 100 per cent of the nitrogen in beer is in the form of protein or amino-acids which are utilized in the body. The higher gravity beers, as might be expected, show a higher nitrogen value than the low gravity beers; but is not all this beside the point? Beer is consumed because it is to so many a pleasant and palatable beverage. The thirsty man pays no regard to the food value of beer; he looks upon it as a pleasant, refreshing drink, and he is right; and it is fallacious once and for all to justify its consumption on the cult of calories or "tissue formers."

There is, however, one point overlooked in regard to the rôle of beer in the dietary. It contains a material amount of diet deficiency substances of the order of vitamines, and investigations have shown that beer added to the dietary increased the assimilation of the non-nitrogenous foodstuffs, and particularly of fats, while alcohol in moderate amount increased protein absorption from nitrogenous foods. Then, again, beer has undoubtedly a condimental action and often makes the simple meal attractive, if it is only bread and cheese. Thus regarded, beer, instead of representing a waste of food materials from which it is made, may actually effect an economy in inducing in those whose custom it is to drink it a better appreciation of the food they consume. In the recent bitter controversy about the merits and demerits of beer this consideration should not be left out of the equation, in justice to beer-drinkers who are modest in their demands for the national beverage.—*Lancet*, Sept. 15, 1917.

ACTIVE TREATMENT IN ESTABLISHED ECLAMPSIA.

In the *Lancet* of September 15, 1917, STRACHAN asserts that to empty the uterus is the keystone of our operative efforts, and is a most rational procedure. A safe rule in practice is this: unless a case of eclampsia be showing immediate, speedy, and considerable improvement by palliative treatment, empty the uterus at once. Consider only the mother's interests, and entirely disregard those of the fetus. Bumm quoted 30 per cent mortality with expectant treatment, but since 1901 he has delivered as soon as possible after the first fit, and now reports a mortality of 2 per cent—truly a changed figure. Most obstetricians will agree in recommending this line of treatment, although Ballantyne and Stroganoff, amongst others, still advocate expectancy. In most cases labor will have set in, and if so, the uterus may be left to empty itself, possibly with the help of forceps; but unless some strong indication be present—*e.g.*, extreme collapse—no rough method of haste must be employed. However, if dilatation be too slow, and the eclamptic condition becomes worse, operative cervical dilatation is called for.

Forcible dilatation by hand or by Harris's dilators must be done if at all only with very great care, as much operative shock is caused by such a procedure. In such a case Strachan strongly recommends incising the cervix; the accompanying loss of blood is of benefit and full dilatation is immediately secured. Again, any necessary intrauterine manipulation may now be proceeded with; of these latter version and forceps will be the most often called for, and version will be indicated, especially when speed is required—*e.g.*, when the fetal heart be heard.

When the uterus is emptied as described, and unless the case be very grave and far

advanced, immediate and continuous improvement will be noticed and recovery will be rapid, contrasting strongly with the uncertain and anxious state of affairs when purely expectant treatment is relied on.

TREATMENT OF ASPHYXIA NEONATORUM.

In the *Long Island Medical Journal* for September, 1917, ALLEN, in writing on this subject, tells us that his paper is a plea for better and more scientific treatment of the asphyxia of the new-born. In the United States alone one hundred thousand infants die annually from this at birth.

The larger number of cases need no treatment, but to be prepared is at least a step to drive away the scare, and better results will be the end gained. The day that has the largest death toll is the day of birth, and to change this something better than the old time-worn methods must be used.

The first requisite is to preserve the body heat, for to try to resuscitate a cold, half-dead child is almost always a forlorn hope. A soft-rubber catheter is to be passed into the throat and the mucus and liquor amnii removed to clear the smaller bronchi. Next some means of insufflating the lungs with warm, damp air and oxygen is the safest method of procedure. Some prefer the lung motor, others the pulmotor, and the mouth-to-mouth method may be used. He feels that by the use of his resuscitation horn the best results have been gained, as by this simple instrument the human touch is not lost, and with this means the lungs are never overdistended and oxygen is admixed with warm, damp human breath. Dilatation of the stomach is prevented by keeping the fingers of the left hand along the free border of the ribs over the stomach. One's own warm, damp breath admixed with pure oxygen is forced into the infant's lungs while the babe rests on a hot-water bottle over which is a blanket, and then the babe is covered with another blanket. The body heat is thus preserved, the requisites for life are given, and the human touch is never lost as it is in the more mechanical lung motors.

The methods of Sylvester simply scratch the surface, and Schultze waves the child in the air, losing all body heat; Laborde's method rattles the tongue, and Byrd's method has some good points and is of use, but is more often abused in the hands of internes and the unskilled, as rupture of the liver may result, or the child be squeezed to death by the force usually employed.

All resuscitation methods should be practiced not more than seven to ten times per minute at first, and never cease so long as the heart is seen or heard to be in action.

The air-cushion about the mask is inflated and the mask placed over the face of the child, and warm, moist, human breath is breathed into the lungs of the infant. By

Horn inhaler for asphyxia neonatorum.

placing the fingers of the left hand at the free border of the ribs of the infant, inflation of the infant's stomach may be avoided. In the hollow shaft of the horn there are two items of interest: one a damper valve which can shut off the shaft entirely, and another a stop-cock below the damper valve to which may be fitted the rubber tube from an oxygen wash-bottle for administering oxygen when desired.

The warm, moist human breath containing a small amount of CO_2 can be administered by this method. Those realizing the infant's need at such a period are able to

more delicately and efficiently administer admixed oxygen as may be desired and with all the human touch so necessary, but usually lost in other procedures.

Never will lungs be overinflated, and never will the lungs fail to be filled, because of the hand on the infant's chest, guiding lung inflation, the same hand preventing stomach distention; and in Allen's experience this simple instrument has saved lives that would not have been possible with the more mechanical cold-air motors.

Anesthesia may be administered through this horn and by virtue of the damper valve with or without the admixture of oxygen, by simply placing gauze in the shaft as a sponge to absorb the anesthetic desired. So with this simple instrument in the obstetrical bag a resuscitation device is at hand as well as an anesthetic mask. The shaft of the horn unscrews and takes less space in packing.

THE LIMIT OF SAFETY OF LEAD IN WATER-SUPPLIES.

The *Lancet* of September 8, 1917, deals with this important clinical, and possible medicolegal, subject as follows:

Dr. John C. Thresh, medical officer of health of the Essex County Council, points out that it is not generally known that certain natural waters contain traces of lead in solution. As far as his experience extends these waters are always derived from mountain limestone in neighborhoods where veins of galena are met with. The amount of lead varies between 1 part in 12½ millions and 1 part in 25 millions, equivalent to 1/178th and 1/357th of a grain per gallon of water.

Dr. Thresh quotes several authorities on the question of the limit of safety for the lead content of a potable water, who concluded in general that a water containing 1/100th part of a grain per gallon or even 1/300th part of a grain might be injurious to health, but he suggests grave reasons for doubting whether such a conclusion is correct. The amount of lead shown on a single sample may, likely enough, be far below the average amount found in the water, and in one of Dr. Thresh's cases the water often contained one-fifth grain of lead per gallon. These observations refer apparently to waters which had taken up lead in passing through service pipes, and such waters may at one time contain even less than 1/300th of a grain per gallon, yet at others may contain even as much as 1 grain per gallon. On the basis of a daily intake for drinking purposes of 3 pints of water, a person would consume 137 gallons per annum, and hence to ingest one grain of lead from a water containing 1/100th of a grain per gallon the consumer would have to drink at this rate for nine months, or for over two years if the water only contained 1/300th of a grain per gallon. Dr. Thresh observes that the kidneys of an individual adult or child which could not eliminate the metal at this rate would be in such a condition that he would be unlikely to live long enough to accumulate a poisonous dose of the metal, and he quotes Sir William Osler to the effect that "lead is rapidly eliminated by kidneys and skin," and that "children are relatively less liable and females more liable to suffer from lead poisoning than men."

In Dr. Thresh's opinion, when a natural *hard* water contains lead in a less proportion than one in five millions it may be passed as practically free from lead and perfectly wholesome so far as the lead contents are concerned. In the case of *soft* waters which take up lead from supply pipes he does not think it would be wise to pass a water containing one part per million, unless it was perfectly certain that the water was being so treated that this amount was never exceeded. There is to be reckoned with also the possibility of a natural hard water carrying from time to time particles of sinter containing lead in suspension. As is pointed out, in the neighborhood of lead-mines, used or disused, it is not unusual for cattle to be poisoned by lead. Such lead does not appear to be in solution but in suspension, which is removed by careful filtration. In one instance in a spring water Dr. Thresh

found one part of lead in five millions, but after filtration it only amounted to one part in 25 millions.

WHAT SHOULD THE PRACTITIONER KNOW ABOUT THE WASSERMANN REACTION?

The *Cleveland Medical Journal* for September, 1917, contains an article by EISENBERG in which he gives this wise advice:

1. Do not hesitate to give the serologist as complete a history of the case as possible, when sending the blood for Wassermann test—you want it for the physical examination, he should have it for the Wassermann test.

2. Insist—when a treated case is referred—to have the laboratory do the "titration" test; it will prevent much disappointment.

3. Tell the patient to leave whisky and beer severely alone for 48 hours before the blood is taken for the examination.

4. Eisenberg believes the Noguchi modification is a much more delicate test, giving at least 15 to 20 per cent more positive results in syphilitic cases.

5. Not only a single negative test on the blood, but even when repeated—does not exclude lues—we may be dealing with cerebrospinal syphilis in which the blood is, in a great majority of cases, negative. No one should be pronounced free of syphilis until both the blood and the cerebrospinal fluid have been examined.

6. Repeated positive tests almost daily always mean infection, but remember that there is such a thing as a false positive test.

7. Remember that some bloods and cerebrospinal fluids, especially the cases of the vascular and cerebrospinal lues, are "Wassermann-proof" (Wassermann-fast).

8. At least two antigens should be used in doing the test—personally Eisenberg prefers the acetone-insoluble lipoids (Noguchi Antigen) and the cholesterinized heart (Sachs antigen). The latter is extremely sensitive, so that it is of the greatest value when negative, as it absolutely excludes the infection.

EXPERIMENTAL ACCLIMATIZATION TO THE TROPICAL SUN.

In the *Philippine Journal of Science* for January, 1917, SHAKLEE reports investigations on this subject in animals and man. His conclusions are that:

1. The normal temperature of the Philippine monkey probably varies between 37.5° and 39.5° C.

2. Unacclimatized Philippine monkeys (genus *Pithicus*) exposed to the sun in Manila live, or die, of heat-stroke in the course of from several minutes to several hours, depending upon the conditions.

3. The conditions making for a rapid death are: A hot sun; proximity of a large, hot surface, such as the ground or a roof; high relative humidity of the atmosphere; and a low wind velocity.

4. The death under these conditions is due to an accumulation of heat in the body.

5. The lack of any one of the above conditions may prevent death.

6. The effect of the sun's rays alone on this monkey is comparatively slight.

7. These monkeys on a suitable diet become acclimatized to the conditions mentioned, if exposure to the conditions is gradual.

8. A small dose of atropine will cause the death of an acclimatized monkey by stopping the perspiration.

9. The acclimatization consists in an increase in the sensitiveness of the nervous mechanism which regulates the body temperature. The increase in sensitiveness produces an increase in the rate of perspiration under the conditions named above, producing in this way what may be termed an immunity.

10. This immunity is readily lost if the monkeys are kept in the shade.

11. Some forms of sickness diminish the powers of resistance to the above-mentioned conditions.

12. Some toxins produced in the intestine lower this resistance.

13. Rabbits showed no increase in resistance when treated in the manner used to acclimatize monkeys.

14. Healthy white men may be readily acclimatized to the conditions named, that is, to the tropical climate at its worst.

15. The amount of sweating necessary to keep the body temperature of a healthy white man from rising above normal is not excessive, even when the man is doing considerable physical work, in the midday sun in such a tropical climate as that which obtains at Manila, provided the man has been sufficiently long on a suitable diet, and introduces himself gradually into the work in the sun.

16. In the acclimatization of the white man the most important factor is the proper regulation of diet.

17. The effects from the tropical sun seemed to be exactly the same as the effects from the sun in the United States; that is, no effects were seen or felt in these experiments that were different from what would have been expected under like circumstances in the northern portion of the United States.

HEMORRHAGE: ACCIDENTAL, INEVITABLE, POSTPARTUM.

In the *Boston Medical and Surgical Journal* of September 20, 1917, DE NORMANDIE states that for some years he has taught that any patient who shows bleeding from the vagina without pain in the latter half of pregnancy must be regarded as having a placenta previa until it is conclusively proved that such is not the case, although he does not say that every woman who bleeds without pain has a previa.

Palpation of the uterus with this condition shows it to present the normal uterine feel, either of a uterus in labor or not in labor. The presenting part not infrequently is quite high, because of the position of the placenta, and the position of the fetus may be abnormal for the same reason. The fetal heart is heard, or its sound is absent, depending entirely upon the amount of bleeding which has taken place.

A vaginal examination gives almost without exception a very soft cervix, not infrequently a patulous os, especially if the patient is a multigravida. Further careful examination gives a boggy feeling to the examining fingers in one or the other of the culs-de-sac, or if the variety is complete over the entire vaginal vault. The examining fingers do not come directly to the presenting part.

The bleeding without accompanying pain, the presence of a boggy mass in the lower uterine segment, are the necessary points on which a diagnosis is based. De Normandie does not believe the statement that "in the absence of evidences of a toxemia it (this condition) is probably a placenta previa" is correct.

There is one point in making a vaginal examination in a suspected person that must always be kept in mind. If the examining finger is passed through the cervix, as usually can be done with little or no pain, and one opens the sinuses, he must remember there may occur a tremendous hemorrhage, one which may seriously jeopardize the patient's life. Because of this danger, it is De Normandie's custom to palpate carefully the cul-de-sac first, and if the diagnosis is clear, never to touch the cervix until he is prepared to do more if necessity should arise. Occasionally bleeding is profuse and a vaginal examination gives unsatisfactory data; then he never hesitates to pass the fingers through the os in order to palpate the lower segment, remembering, however, that this never should be done unless everything is prepared for further treatment.

A recent case will explain more clearly his meaning about vaginal examination in cases of possible placenta previa.

A primigravida, twenty-four years old, in her eighth month, telephoned that she was flowing very profusely. De Normandie went to her at once and obtained the following story: She was in the midst of taking a warm bath in the bathtub when she noticed that the water became red in color. She at once got out of the tub and found that blood still continued to run down her legs. She went at once to bed and placed at her vulva a heavy bath towel. De Normandie saw her within half an hour, and

found that there still was a slight amount of fresh bleeding going on. By this time she had soaked through several layers of the towel. She stated that in the last few minutes the bleeding was distinctly less. Her pulse was 80, her color good. The uterus was soft, no evident contractions, and not tender to palpation. The fetal heart was regular.

He decided to take her at once to a near-by hospital and there make the necessary examination. She was at once prepared, and when all the preparations for operative interference were completed she was examined under rigid asepsis. She was given gas and oxygen, as at a previous vaginal examination it was found that she had a very tight introitus. No definite placenta was felt in the lower uterine segment through the culs-de-sac. The head was entering the pelvis. The cervix was very soft. Inspection showed that the blood was coming from the uterus. De Normandie determined to make positive that there was no partial previa, so he pushed a finger through the cervix, but in no portion that he could reach was there any placenta to be found. He gave her at once ¼ grain of morphia. The diagnosis was a slight detachment of a low-situated placenta. There was no indication to operate. Rest in bed, with small amounts of morphia and careful observation, was indicated. The next morning she passed a small amount of dark-colored blood and one or two small clots. The uterus was normal in its feel and the fetal heart was regular. At the end of a week she was sent home, not having had any further bleeding. Four weeks later she started up on labor and was delivered of a seven-pound baby by low forceps very readily. The placenta came away intact with all the membranes, and inspection showed one small portion at the periphery to be much darker and more firm than the rest of the placenta. The break in the amniotic sac was not noted as being close to the placenta.

Here was a case conservatively managed. Undoubtedly some would say it was radically treated because of the thorough examination. It is much better to cause an occasional patient to miscarry than to allow a possible previa to go undiagnosed.

The prognosis in these cases is at the present time relatively bad, and it is bad for two reasons—the first because an inevitable hemorrhage must occur, and how serious that will be no one can foretell. One single hemorrhage may kill. The second reason is because by far the majority of these cases are badly managed. Hospital statistics are no criterion for the prognosis which should hold in this condition. The patients are sent into the hospital not infrequently moribund, and so the statistics are necessarily very high.

The prognosis for the child is very bad and is capable of but little improvement, because of the fact of the hemorrhage and because so many of the babies are premature. In the treatment of this condition the first thing to do depends entirely upon the amount of blood already lost and whether the patient still is losing blood. If the hemorrhage is severe, a tight vaginal pack may be the only possible treatment at first. Such a condition is fortunately rare. The bleeding is caused by the normal intermittent uterine contractions which are constantly going on in pregnancy, opening the sinuses and allowing hemorrhage to take place. These sinuses, then, by the same normal contractions and retractions of the uterine fiber, close and the bleeding ceases. It is generally at this point that the physician arrives and must at once lay out an intelligent line of action.

Unquestionably a well-equipped hospital is the place to handle any bleeding case, but such hospitals are not always to be had. If the patient is not removed to a hospital, then complete preparations must be made for the delivery at home. What that means there is no need of going over, but never attempt a delivery of such a case without sufficient help. As in accidental hemorrhage, the best treatment in any individual case will vary. Though the need for immediate delivery is not many times as urgent in this latter condition as in the former, no unnecessary delay is permissible.

The condition of the cervix is the chief underlying point in what treatment had best be given the individual problem, and this predisposes the determination of whether the patient is in labor or not and whether she had other pregnancies before this one. The size and the condition of the child is a further aid in helping decide what is the best treatment. If the child is full-termed and in good condition, we are, De Normandie thinks, justified in subjecting the mother to a slightly increased operative risk for the child's sake, unless the parents definitely demand that not the slightest risk be added to the mother's burden. It must be remembered that the Catholic church holds a fetus cannot be deliberately sacrificed, and this must be respected when operating in a Catholic family.

In the same issue of this *Journal* TITUS writes his views in these words:

The only operation which is logical and which does not subject the mother to too great risk, in a primipara not in labor, is Cæsarian section. While attempting to dilate the cervix of such a case the bleeding continues, and at the end of an *accouchement forcé* the mother may have sustained so much loss of blood that, with the resulting shock, she cannot recover. Vaginal Cæsarian in cases before eight months offers a better chance on a primipara than any other vaginal operation. If a primipara be in labor when the condition arises, the dilatation and the softness of the cervix will be the determining factors in what operation to choose. If the cervix is soft and dilates easily, the vaginal route may seem safe enough. If the cervix is not soft and offers much resistance, laparotomy will better fit the emergency.

In a multipara not in labor all depends upon the cervix. If it be soft and one that will dilate easily, the vaginal route may be chosen. If firm, with scar tissue, better choose the abdominal route. If the vaginal route be chosen, dilatation must be accomplished completely and quickly. Braxton Hicks's procedure is contraindicated. The loss of blood sustained during the extraction of the baby through a partially dilated cervix may be more than can be endured. The operation must be done quickly. The bleeding must be stopped.

GLYCOSURIA AND PREGNANCY.

In the course of an article in *Northwest Medicine* for September, 1917, TORLAND states, in regard to the treatment of pregnant and diabetic women, that it would seem the regular antidiabetic diet ought to be carried out as usual; only under certain conditions can it be necessary to make concessions. Especially in the first part of pregnancy, due to nausea, vomiting, etc., will it often be imperative to allow the patient extra things outside the strict diet, but this must be done very carefully and only what is absolutely necessary. The carbohydrate consumption must be as near the tolerance point as possible, except in the presence of grave symptoms of severe headache, vertigo, partial or complete blindness, and acetone and oxybutyric acid in the urine. If these symptoms are not relieved by high rectal irrigations containing maximum doses of sodium bicarbonate, the carbohydrate ingestion must be increased regardless of theoretical objections. Joslin calls especial attention to the rôle fat plays in the formation of acidosis and warns very strongly against its excessive use.

From a practical standpoint the treatment of a pregnant, diabetic woman is very interesting, because everything is so very uncertain, and many times it is very difficult to take a definite standpoint. There are factors to count of which we do not know. Is the diabetes a progressive or a stationary one? What shall we do? Shall the dietetic treatment be continued, or shall abortion be induced? In regard to this last question, the opinions are very much divided. Nobody doubts that pregnancy and diabetes have a very unfavorable influence upon each other. Both the life of the mother and the child are in great danger. The experience of many authors shows that a previously light diabetes can be made very much more grave by the occurrence of pregnancy, and, on the other hand, there

are several reports that the removal of the fetus has improved a severe diabetes, even causing threatening symptoms of coma to disappear.

The question of abortion in these cases has been discussed extensively by Offergeld, who especially emphasized the fact that, if it is at all indicated to sacrifice the fetus for the mother, it is very dangerous to wait, hoping to get a viable child. We will then most always risk both mother and child succumbing.

In regard to the anesthetic, chloroform is absolutely contraindicated. Ether is a little better, but most advocated is gas-oxygen, or in many cases spinal or novocaine anesthesia. Especial emphasis must be paid to asepsis, as the diabetic woman's tissues are especially vulnerable to microbic infection. If these precautions are taken a gynecologic operation in a diabetic is not very much more dangerous than in an ordinary individual.

THE WAR AND VENEREAL DISEASES.

In the *Medical Record* of September 22, 1917, TULLIDGE states that the two prophylactic treatments for gonorrhea and syphilis have received wide attention and consideration. The former army "K" packet, containing a solution of 20-per-cent protargol or 10-per-cent argyrol, a medicine dropper or syringe, and a vial of 30-per-cent calomel ointment, was effective when used not only as a prophylactic, but within two hours after intercourse. In a section of over seventeen hundred militiamen who received this treatment properly on the border during the last mobilization, thirty-eight developed venereal diseases. Ten were primary luetic sores, ten chancroids, and the remaining eighteen cases gonorrhea, which was complicated in seven cases with one of the former infections. With these results this treatment could hardly be called successful, and the large percentage of infections resulted either because of the failure of the men to apply for the treatment within the prescribed time after intercourse or because of the failure of the ointment to come up to its declared standard of efficiency.

With these possibilities in view and with the idea of providing for the men in the naval service who are unable to obtain treatment within the prescribed two-hour period necessary for proper results, Bachman, of the U. S. Navy, after an exhaustive investigation and experimentation, both at home and abroad, prepared an ointment similar to Metchnikoff's preparation, but which Metchnikoff himself declared to be a great improvement over his own original preparation in the treatment of syphilis. This ointment, which contains 33 per cent calomel reënforced by 1 per cent trikresol, he placed in a collapsible tube carefully prepared and enameled throughout inside to prevent a degeneration of the mercurial substance by contact with the metal of the tube itself. A soft-rubber tapering nozzle one and one-half inches long, which may be introduced well up into the meatus beyond any possible area of infection, covers its mouth. This preparation he claims is most efficacious, and from the many reports of trials given it and the excellent results obtained in cases in which Tullidge has recommended its use, he is convinced that it has decided advantages over all other prophylactics of its kind at present in use. It is smaller in bulk, more compact, and therefore more easily handled. If carried upon the person at all times and properly used both before and immediately after intercourse, or within an hour, it has decided advantages over all other treatments.

CHRONIC VALVULAR HEART DISEASE IN PREGNANCY AND LABOR.

The *Boston Medical and Surgical Journal* of September 20, 1917, contains quite an elaborate paper on this topic by KELLOGG. The following conclusions are drawn from his study of chronic valvular disease in pregnancy and labor:

1. One-half per cent of pregnant women have chronic endocarditis.

2. Fifteen-twentieths per cent show some decompensation under prenatal care; half

these 1 degree decompensation, half 2 degrees decompensation.

3. Cases with stenosis of the mitral valve, with or without insufficiency, are far likelier to decompensate in pregnancy than cases with simple insufficiency.

4. The maternal mortality of chronic valvular disease in pregnancy is 2 per cent. The maternal mortality of cases showing 2 degrees decompensation, requiring induction, and 2 degrees decompensation in labor, is 45 per cent.

5. Mitral stenosis is almost always present in fatal cases.

6. Fetal mortality runs from 10 per cent, in a series including all cases, to 40 per cent in cases with 2 degrees decompensation.

7. Chronic valvular heart disease complicating pregnancy is, in view of these figures, potentially a very serious condition for mother and child, and the handling of these cases requires the utmost attention and skill, frequent prenatal observation being an absolute necessity in all chronic valvular cases complicating pregnancy.

8. Half of these cases *not under good previous care for their heart condition,* which show decompensation, will recover sufficiently under medical treatment, rest, and the proper regulation of their lives so that they do not again decompensate, and so that they will stand any appropriate method of delivery at term.

9. Many chronic valvular heart cases compensated and with only slight degrees of decompensation and some with 2 degrees decompensation will safely deliver themselves if allowed to. Though this fact is undeniably true, theoretically, and with what data we have at hand, it should not be allowed.

10. Normal delivery and *accouchement forcé* have no place in the treatment of chronic valvular heart cases in pregnancy or labor.

11. It is not justifiable to attempt to carry a woman who is decompensated to term for the sake of her baby unless she reacts favorably to treatment almost immediately, especially as the fetal mortality in these cases is so high that we overrisk the mother for the sake of a problematical child.

12. "Cardio-pregnancy literature" on the whole is inadequate because no classification is used to determine the factors in the cases under discussion. Some classification is deemed necessary which will visualize, at least, the period in pregnancy, the degree of decompensation and the character of the cervix, and whether or not the patient is in labor.

CARDIOVASCULAR-RENAL DISEASE.

In the *United States Naval Medical Bulletin* for October, 1917, H. A. HARE has an article on this topic, and in it writes as follows:

It is important to remember that mere excess of blood-pressure, while it may bespeak abnormality, is by no means sufficient justification for shelving an efficient individual. It must be recalled that the use of the sphygmomanometer may, through nervousness and apprehension from the novelty of the procedure, give a record 15 or 20 points higher than that usually present, and, if the reading is 185 systolic, undue importance may be attached to this, whereas a second examination within a few minutes, or on another occasion, particularly after a period of rest, may show that the average pressure is probably as low as 160 or 165, which in turn is quite within bounds for some persons.

The point to be remembered about blood-pressures ranging from 160 to 180 is that their prognostic and diagnostic importance depends more upon what is found as to the heart and as to the kidneys than upon any other factor. If the kidneys are right, or repeated examination shows that they are only slightly wrong, a pressure of 180 has not the evil significance that a pressure of 160 would have if the heart is feeble or tired and the kidneys much impaired. If the urinary examination is fair, the point to be determined as to the individual's efficiency should be reached not only by ordinary methods of examining the heart, but by studying the difference between the

diastolic and systolic pressure after rest and after exercise. If the diastolic pressure is constantly high, above 110 or 115, the high systolic pressure indicates a still greater strain upon the heart, and if the difference between the diastolic pressure and the systolic pressure be only 10 or 15 points in a case of high tension, in all probability the reserve power of the heart is so impaired by exhaustion or disease that a cardiac crisis or the development of rapid cardiac failure may be expected.

Under these circumstances there can be no doubt as to the value of stair-climbing or other forms of effort in determining cardiac efficiency. Going up 20 or 30 steps at a fair speed if followed by no rise in systolic pressure, or if followed by a fall, is very significant as indicating that the individual is incapable of being subjected to severe mental or physical stress. In other words, the mere height of the systolic pressure, unless it is so extraordinary as to endanger the integrity of the blood-vessels, has nothing like the significance that is possessed by a very high diastolic pressure, a poor pulse pressure, or by a definite fall in pressure on moderate exercise. Many persons with a high blood-pressure have developed a compensatory hypertrophy which enables the heart to overcome this *vis a fronte* with impunity, whereas many others with a comparatively low systolic pressure are constantly on the border-land of more or less acute cardiac breakdown.

In other words, as was indicated at the beginning of this article, there are few conditions met with by the medical man in military or civil life in which his diagnostic and prognostic acumen is so thoroughly tested as in the study of cardiovascular renal states; there are few in which his professional judgment may be followed by so much credit or discredit, and there are few in which the immediate and possibly the remote future and happiness of the patient more largely depends.

This subject illustrates once more that he who attempts prognosis and diagnosis on one major symptom is faulty, and that correct and accurate conclusions can only be reached by thorough investigation and a careful balancing of all the pros and cons in the case.

Finally, he emphasizes the value of the estimation of non-protein nitrogen in the blood for its prognostic importance in renal cases. He is well aware that it, like all other factors in diagnosis, is not to be given too great importance, but a high non-protein nitrogen percentage, in association with the other symptoms described, will, like a sudden change in barometric pressure, put the physician in a position to be ready for the storm that may arise.

FURTHER STUDIES WITH THE SCHICK TEST.

In the *Archives of Internal Medicine* of September 15, 1917, ZINGHER after an exhaustive study of this subject reaches these conclusions:

1. The number of pseudo-reactions varies in different age groups, but is considerable after the eighth year of life.

2. The intensity of the pseudo-reaction varies from a simple redness to a reaction showing marked redness and infiltration.

3. For accurate work, or where the test is to be read at the end of thirty-six to forty-eight hours, the control test with heated toxin is important.

4. The antitoxin immunity which an infant derives from its mother lasts for about six months after birth. The Schick test illustrates in a very definite way the protection against diphtheria which an infant enjoys during the first half year of life.

5. Where the mother gives a positive Schick test, her infant will also generally show a positive test during the first six months of life. Where the mother gives a pseudo-reaction, the infant, if young enough, will as a rule show a negative and not a pseudo-reaction. The susceptibility of the tissue cells to the bacillus protein, which gives the pseudo-reactions, is not transmitted from mother to offspring.

6. The largest number of positive Schick reactions is found in children between 6

and 18 months of age. This is therefore the best time, not only to test the children, but also actively to immunize with toxin-antitoxin those who show a positive reaction.

THE SCABIES PROBLEM ON ACTIVE SERVICE.

To the *British Medical Journal* of September 22, 1917, MacCormac and Small contribute a practical article on this topic. They believe that for its simplicity and certainty, no method is so suited for general use as that of simple inunction with sulphur ointment (B. P.), and admirable results will invariably be obtained, *if the treatment is conscientiously carried out and with due regard to the necessary details.* It must, however, be insisted that the method of application is of paramount importance. This may be briefly outlined as follows:

On the first day of treatment the patient is given a hot bath and provided with plenty of soft soap and a large, moderately stiff nail-brush.

(*a*) Before entering the bath, he rubs himself thoroughly all over with the soap, massaging it into the skin, and paying particular attention to the fingers, toes, wrists, penis, and axillæ. This should be continued for at least ten minutes.

(*b*) He then enters the bath, which should be both long enough and contain a sufficiency of water to permit of immersion to the neck. After first steeping for fifteen minutes, he scrubs himself vigorously all over with the nail-brush for the purpose of opening burrows and vesicles. If the eruption is particularly severe or painful this part of the procedure may be correspondingly modified. After the bath a final inspection should be made, when any unruptured vesicles can be opened with a surgical needle.

The bath is given with the sole object of opening up the haunts of the acarus and exposing it to the action of the parasiticide to follow. It is obvious that shower or steam baths cannot fulfil this purpose, and examination of a patient so treated will reveal the burrows and vesicles still intact.

After removing the soap and drying, a liberal quantity of sulphur ointment is provided, with which the patient rubs himself vigorously all over, from the neck downward, special attention being paid to the affected parts and to the fingers, wrists, genitals, axillæ, toes, and ankles. The ointment must be liberally applied and thoroughly rubbed in, so that when finished he should be literally "soaking" in it.

The inunction is to be repeated in this manner twice daily for three days—that is, until the patient has had in all six applications. Each must be complete, and for this it is obvious that all clothing must first be removed. The treatment of limited parts of the body is useless.

Finally, on the fourth day, but not before, a second bath is given, and all the patient's clothing and bedding sterilized to prevent reinfection. Even such articles as wrist-straps, strings of identity discs, gloves, etc., should be included.

The vast majority of cases, unless there be secondary complications, will be found cured after three such days of treatment. Should any doubt exist, 2 per cent beta-naphthol in vaselin may be used daily for four more days. Only under exceptional circumstances should sulphur ointment be applied for more than three days, since its continued use is liable to cause severe dermatitis. Indeed, in susceptible persons a mild degree may be occasioned by the three-day treatment. This is usually easily cured by zinc ointment or Lassar's paste. At the completion of treatment the existence of some degree of itching is not uncommon; this is due to the remedy, and does not indicate failure of cure; it will rapidly pass off, and should be disregarded. Some days also will probably elapse before all the lesions of scabies have disappeared, although the man is no longer infective. A certain degree of pigmentation may persist indefinitely.

Scabies in soldiers differs in type from the ordinary form seen in civil practice, particularly in the frequent absence of bur-

rows or other lesions upon the hands, and in the great liability to pyodermic complications.

The primary disease is often masked by complications. In every case of impetigo, boils, dermatitis, or inguinal adenitis, scabies must be carefully excluded before the diagnosis is considered complete.

Cases of scabies complicated by any of the above necessitate about ten times as long a period in hospital as simple cases, therefore early diagnosis and treatment, before secondary diseases have become established, are of the greatest importance.

Regular medical inspection is essential for the detection of "carriers." Infected men should be segregated and treated at the earliest opportunity; horses may also require inspection. Blankets being the chief source of spread should be sterilized as often as possible.

Treatment by means of sulphur vapor is a method harmful often to the patient, and at all times dangerous to the community in that it manufactures a class of scabies "carrier." In the interests of the army it should be discontinued.

The method of treatment most suitable to service conditions on account of efficiency, simplicity, and cheapness is inunction with sulphur ointment, but this must be carried out in a methodical and thorough manner, and with careful attention to the necessary details.

THE USE OF BAKERS' YEAST IN DISEASES OF THE SKIN AND OF THE GASTROINTESTINAL TRACT.

In the *Journal of the American Medical Association* of October 13, 1917, HAWK, REHFUSS and CLARKE make a laboratory and clinical report on this subject.

In all of their tests they used Fleischmann's compressed yeast, as that is the best known and most widely used of bakers' yeasts. The fresh yeast was used in all cases, a new supply being secured two to three times a week and kept in the refrigerator until used.

The literature of the yeast question is so voluminous that the writers make no attempt in this connection to give a comprehensive survey of previous work. Their main purpose is to present a brief summary of the cases they have studied. Those who are interested in the literature of the subject are referred to Lardier, Krause, and Hedrich, in whose articles a very full bibliography will be found.

Hawk and his colaborers have made a study of ninety-one cases. They made tests on normal persons to learn the action of yeast in the stomach when given suspended in water, beef tea, or orange juice, with meals or between meals. They also studied the comparative effect of living and dead yeast. The yeast was killed by treating it with boiling water for a few minutes. All stomach examinations were made by means of the fractional method.

From these tests it is apparent that yeast may be administered satisfactorily either with meals or on the empty stomach. It is also apparent that killed yeast (that is, yeast placed in boiling water for a few minutes) acts much the same in the stomach as living yeast. If the patient is troubled with gas formation it is preferable to use killed yeast, or to administer yeast between meals.

These tests also demonstrated conclusively that yeast is not readily destroyed in the human stomach, but that on the contrary, especially when taken between meals, a large part of the yeast passes into the intestine in the living condition. Hence it is possible that in certain disorders, especially those involving constipation, the living yeast has a more pronounced action than dead yeast.

The yeast treatment gave the best results in furunculosis, acne vulgaris, acne rosacea, and constipation. The treatment also was useful in acute bronchitis, urethritis, conjunctivitis, swollen glands, folliculitis, gastrointestinal catarrh, intestinal intoxication, arthritis deformans, and duodenal ulcer. The laxative effect of the yeast was observed in cases other than those of constipation. In fact, in some instances the

laxative effect was so pronounced that it was necessary to reduce the dosage. Both the fresh yeast and that killed by boiling water showed laxative power. In one case the patient became constipated under yeast treatment.

So far as gastrointestinal conditions are concerned, it is apparent that yeast has its greatest usefulness in conditions accompanied by cutaneous manifestations.

It seems to the writers that yeast is essentially indicated in chronic non-obstructive bowel conditions and contraindicated in the acute conditions.

Whether the success of yeast in acne vulgaris and acne rosacea is due alone to its laxative action or to some fixed effect on the intestinal tract, the writers are unable to say. The preparation was laxative in all these cases, in two so much that a half dose was given for a few days. There was considerable gas formation, but no complaints were made on this score.

In furunculosis, yeast is a remarkably efficacious remedy. Its curative action in these cases is no doubt aided by the leucocytosis which is developed.

These writers therefore conclude that:

1. Bakers' yeast was found to be a useful remedy in the treatment of furunculosis, acne vulgaris, acne rosacea, constipation, and in certain other cutaneous and gastrointestinal conditions.

2. The conditions which responded most favorably were (*a*) furunculosis, (*b*) the acnes (vulgaris and rosacea), and (*c*) constipation. Of seventeen cases of furunculosis, all but one of the patients were improved or cured. Of seventeen cases of acne vulgaris, all patients were improved or cured. Of ten cases of constipation, nine were improved or cured. In other words, fifty out of fifty-two cases of furunculosis, the acnes, and constipation were improved or cured by yeast treatment.

3. They consider that yeast is fully as successful as any other remedy in furunculosis, acne vulgaris, and acne rosacea.

4. In many of the cases which came under their observation, the yeast treatment caused an improvement in the physical condition of the patient quite unassociated with the improvement of the symptoms associated with the particular disease in question.

ON A REGIMEN THAT HAS BEEN FOUND HELPFUL IN THE TREATMENT OF SOME CASES OF SO-CALLED PERNICIOUS ANEMIA.

In the *Bulletin of the Johns Hopkins Hospital* for November, 1917, BARKER and SPRUNT, after discussing briefly the classification of the severe anemias, their etiology and pathogenesis, describe a regimen used by them in the Addison-Biermer type of pernicious anemia which they define as a hemolytic anemia of as yet unknown etiology. They report that in one group of cases they have had a favorable response on applying the regimen they describe, whereas in another group of cases, indistinguishable before applying the regimen, a favorable response was not met with.

The regimen used by the writers, summarized, includes:

1. Treatment in a private room in a hospital or nursing home.

2. Isolation and complete rest in bed under the care of a special nurse and the physician.

3. Careful search for focal infections, and radical surgical removal of any such infections found (especially of infections of the teeth and gums).

4. Milk diet at first, followed by mixed diet rich in protein, the patient being encouraged to eat despite lack of appetite, and disregarding any consequences that may follow the ingestion of the food.

5. An abundance of fresh air, the bedroom windows being kept constantly open when the patient is inside, and the bed being run out upon an open porch in all suitable weather.

6. Dilute hydrochloric acid with and after meals on account of the gastric anacidity, followed three hours after each meal by 45 grains of pancreatin and 45 grains of calcium carbonate. If the pancreatin is

not easily taken by the patient, it is omitted as one of the less important features of the treatment.

7. Arsenic, usually in the form of cacodylate of soda or small doses of salvarsan, is administered as a routine. When cacodylate is given, 50 milligrams are injected intramuscularly once a day for eight days, and after an interval of two weeks a second course of eight injections is given.

8. Massage thrice weekly is given while the patient is in bed. When the hemoglobin reaches 60 per cent gentle exercises are begun in bed; when it reaches 80 per cent, the patient is allowed gradually to sit up and to take gentle exercise in the open air.

9. Blood transfusions are employed only in patients who on admission have a blood count below 1,000,000, or who after a trial of several weeks of the above regimen have not shown distinct improvement.

Splenectomy has not been used in the series of cases mentioned.

THE SALICYLATES.

The *Archives of Internal Medicine* of September 15, 1917, contain the report of a research by HANZLIK and REYCRAFT in which they conclude that:

1. The anuria produced by the administration of full therapeutic doses of salicylate is due to retention of water as indicated by an increase in body weight unless modified by diaphoresis.

2. This retention is demonstrable about twenty hours after the start of administration of the salicylate and persists until the salicyl excretion is completed—that is, about eighty hours (three and one-third days).

3. The retention occurs chiefly in the tissues, for no dilution of the blood is demonstrable by estimations of hemoglobin.

4. The edema is accompanied by a diminution in phenolsulphonephthalein excretion together with an accumulation of urea nitrogen of the blood, and increased excretion of albumin, all of these elements reaching their previous levels with the disappearance of the edema.

5. There is, therefore, a diminution in renal functional efficiency, and since this generally makes its appearance before any actual increase in body weight is demonstrable (edema) and later coincides with it, it seems that the renal factor plays an important rôle in the production of the edema.

6. These phenomena are not modified by the administration of sodium bicarbonate together with the salicylate, and in doses sufficient to maintain the urine alkaline.

[As the doses used were all very large, one more than three drachms, these results should be carefully balanced when considering ordinary doses.—ED.]

ANESTHESIA AND THE ANESTHETIST.

In the *Virginia Medical Semi-Monthly* of November 9, 1917, ECHOLS lays emphasis upon a few points which he considers of major importance, and to do this he knows of no better way than to use a few "don'ts."

Don't talk abruptly to a patient about to undergo an anesthetic for the first time.

Don't forget the principal signs of the different stages of anesthesia.

Don't forget that it only takes one-quarter as much anesthetic to keep a patient under as it does to put him under.

Don't forget that the anesthetist's job is to give the anesthetic, not to do the operation. If a good anesthesia is given there will be no time for anything else.

Don't allow the operation to commence unless the patient is in complete surgical anesthesia.

Don't forget to notify the surgeon if the condition of the patient warrants it.

Don't push the anesthetic too fast from the start.

Don't allow the tongue to obstruct the flow of air into the lungs.

Don't allow the patient to "slide back" in the midst of an operation.

Don't forget to watch the color, respirations, and rigidity.

Don't forget to keep track of the pulse regularly.

Don't overstep the safety line.

Don't get excited if the anesthesia is not perfectly smooth from the start, for an anesthetic in the hands of an excitable person is much more dangerous than in the hands of an absolute novice who follows the prescribed rules and keeps his head.

SERUM TREATMENT OF PNEUMONIA.

The *Medical Record* of November 10, 1917, reminds us that for years, ever since the Klemperers in 1891 announced that they had produced a serum for the cure of pneumonia, which, however, did not cure, attempts have been made to perfect a specific therapy for this disease. Experiments with animals appeared to demonstrate that they could be immunized against lethal doses of pneumococcus by vaccine treatment, and that the serum of such immunized animals was protective in other animals against infection, or even curative when certain precautions were observed. However, it is not always safe to argue from rabbits to man, and the attempts to cure pneumonia in the earlier experiments was due to the lack of differentiation between the different strains of the pneumococcus. As we now know, there are several strains or types of this bacterium, which differ greatly in their morphology, cultural characteristics, and immune reactions, and the serum derived from one type is hardly more effective in an infection by another strain than would be antimeningococcic serum in such infection. In the case of one strain, indeed, that called *Pneumococcus mucosus,* every effort to produce an immune serum has hitherto given no satisfactory results.

Of all recent experiments in the line of a serum therapy of pneumonia, the most promising are those conducted at the hospital of the Rockefeller Institute by Avery, Chickering, Cole, and Dochez. They have succeeded thus far in preparing an effective serum only for Type I infections, but for them they appear to have produced a really curative serum. As about one-third of all cases of pneumonia, at least of the cases coming under their observation, are associated with the Type I pneumococcus, it is evident that it is well worth while to have a serum that will cure most of them, reducing the mortality from 25 to 7.5 per cent or less. The results were actually better than these figures would indicate, for of the eight fatal cases treatment was begun in three only a few hours before death, when they were desperately ill; one recovered from the pneumonia, but died of pulmonary embolism 16 days later; one had an extensive tuberculous involvement of both lungs, and apparently recovered from the slight pneumonia infection, dying more probably of tuberculosis; another was treated late in the disease, and died at the end of nearly eight weeks from a general streptococcus infection. There were, therefore, but two cases in which it could be fairly claimed that the serum treatment failed, and in one of these, an early case in the series, the result was probably due to insufficient dosage. Trials of the serum in other hospitals in New York, Boston, and Pittsburg have also had satisfactory results, and in a series of 65 cases treated by Major Nichols on the Mexican border last fall only 5 died, showing a mortality of 8 per cent, while of 18 cases of the same type infection not treated with serum 7 died, giving a mortality of 39 per cent.

The results obtained by the use of this serum are, therefore, seen to be most encouraging, but they as yet only hold out a hope of a successful specific therapy of pneumonia, and do not actually promise it. Pneumonia is caused by such a variety of organisms—three distinct types of pneumococcus and a variety of other strains not as yet differentiated, but all grouped under Type IV, in addition to many other bacteria than the pneumococcus—that even were there a specific serum for each one the employment of a polyvalent serum covering all forms of infection would be manifestly impractical. Even in the case of Type I infection, the necessity of a differential

diagnosis at the earliest possible moment, and the measures needed to desensitize the patient before giving the serum in the very large doses called for, keep the method out of the category of those adapted to general use. It is available only in hospital cases or in those exceptional ones in private practice in which all laboratory facilities are at the instant disposal of the physician. All these difficulties in the way of a general employment of serum therapy in pneumonia are, however, we may be permitted to believe, only temporary, and one is justified in hoping that these workers, or others inspired by them, will eventually find a remedy for the remaining 66 per cent of cases of pneumonia, and one that is as readily applicable by the family physician as is the administration of diphtheria antitoxin. That such a remedy is urgently needed cannot be questioned, for lobar pneumonia to-day causes more deaths than any of the other acute infectious diseases, and moreover, as shown by recently published statistics of the Metropolitan Life Insurance Company, its death-rate is slowly but steadily rising.

COD-LIVER OIL THERAPY FOR RICKETS.

In the *Journal of the American Medical Association* of November 10, 1917, HESS and UNGER report favorably on the value of cod-liver oil in rickets. They state that it is difficult to determine either the minimum length of time that the oil must be given to accomplish prophylaxis or the minimum dosage necessary. A review of their results, however, shows that a four months' course of treatment, averaging a total of from 16 to 20 ounces of oil, is insufficient to afford protection. Among twelve infants of this group, five were found to show progressive rickets. It would seem that six months should be considered the minimum duration of treatment. It is likewise true that no hard and fast rule can be laid down as to dosage. Their plan was to give infants under six months one-half teaspoonful of oil three times a day and older infants twice this amount. It was found that almost all babies can take cod-liver oil, although it may disagree temporarily and may have to be discontinued for short intervals when there is digestive disturbance. Infants of from two to three months tolerate the oil in half-teaspoonful doses, and younger ones may be given still smaller amounts. This study was not carried out during the summer months, so that it does not provide a criterion for the practicability of oil therapy in the warm weather. As the result of personal experience gathered at other times, they believe that with slight modification it can be pursued throughout the year. In summer, moreover, rickets seems to pass through a quiescent period; therefore treatment is not necessary as in the colder season.

After a few months Hess and Unger arranged that instead of having the oil delivered to them, the mothers should call for it at the neighborhood settlement house, for which purpose an office hour was appointed for each morning and one evening a week. The report of this work gradually spread throughout the district, and the ordinary symptoms of rickets became the common knowledge of the mothers, who often brought their babies to the consultation with the request that cod-liver oil be administered. In this way a rickets clinic was soon evolved. It would seem to be a logical development that specialized clinics should be established to meet the particular needs of a given neighborhood. In Italy quinine is dispensed in clinics formed for those suffering from malaria. Along similar lines have been the creation of tuberculosis and cardiac clinics.

As a result of their experience, they would recommend that dispensaries of this kind be provided in large cities in the negro and the Italian districts, for rickets is almost as prevalent among the Italians as among the colored people. Such dispensaries do not have to be created at large expense. They can be instituted in connection with existing milk or baby welfare stations,

where provision can be made for dispensing cod-liver oil. The details of this plan cannot well be discussed, as they will no doubt differ according to special conditions.

That it is necessary to use Norwegian oil is very doubtful; it is probable that a less expensive cod-liver oil will produce equally good results. In order to combat the high infant morbidity and mortality among the negroes of the Columbus Hill district in New York City, Commissioner Emerson of the Department of Health will establish a rickets clinic in connection with its baby welfare station, and will dispense cod-liver oil at cost.

POINTS ON NITROUS OXIDE.

McGAHEY in the *Medical Record* of November 3, 1917, states that in his opinion nitrous-oxide-oxygen is the anesthetic of choice. Its safety is generally recognized, provided always the administration is in the hands of an expert. He wishes to say that the old idea of allowing an inexperienced or unskilled attendant to administer any inhalant anesthetic is evidence of thoughtlessness on the part of the surgeon who values good results.

He then enumerates some of the properties of nitrous oxide. A gas practically odorless, colorless, with a sweetish taste, non-inflammable, rapid in its action, producing complete anesthesia in from two to five minutes, fleeting in its effect when discontinued, non-irritating to mucous membranes, and producing no ill effect upon kidneys, lungs, or heart.

What does the patient gain by these properties? It gives the anesthetist an opportunity to reassure the patient, to relieve the mental anxiety and stress by assuring him that he will not be subjected to discomfort while he is being put to sleep; that his lungs, heart, and kidneys will not be put to an extra strain; that he can confidently expect a safe conduct to anesthesia, and following that a quick return to consciousness—which latter is uppermost in the patient's mind.

In a large percentage of cases of administration of nitrous oxide we see a total lack of struggling and excitement, these two potent interferences with the respiratory rhythm and consequent causes of acidosis nearly always evinced in the other inhalant anesthetics. The tendency to nausea and vomiting is minimized, and when present is rarely prolonged. Nausea is most frequently caused by insufficient use of oxygen.

A point that McGahey wishes particularly to stress is that no patient should be allowed to become even minutely cyanotic, as even a slight degree of cyanosis over a lengthy period of time produces acidosis with subsequent vomiting, and acid findings in the tissues and urine, acetone or diacetic acid.

Another point of interest is regarding the use of nitrous-oxide-oxygen in the very old. These cases, as a rule, require very little mixture and are rapidly anesthetized; all danger of postoperative pneumonia is evaded, rendering them excellent risks

The author has in mind the case of an old lady, seventy-six years of age, presented for abdominal section. The patient was admitted at 2 A.M., and carried to the operating-room in a state of considerable shock, a rupture of the appendix being suspected. Pulse 120, temperature 103°, respiration 32, abdomen distended; leucocytosis 17,000; the urinary examination gave albumin plus, the heat test precipitating the albumin until the content of the test-tube was a solid mass. The patient was warmed with packs and hot-water bottles; a preliminary injection of morphine, grain ¼, and atropine, grain 1/150, was given immediately; and she was made as comfortable as possible on the table and reassured that all would be well. Nitrous oxide was administered for a period of forty minutes, the appendix was removed, and a drain used. The patient awoke immediately after the operation, was put to bed and placed in the Fowler position for eight hours. Soda and glucose in solution were given by rectum; the patient voided urine without use of catheter, and the albuminous urine cleared up in about seven days. The patient made an uneventful recovery.

If time permitted the writer could give histories of many very old patients who have undergone successfully operations by the aid of nitrous oxide.

A point that is of interest is that the necessity of catheterization is rare when nitrous oxide is used. Another point that may well be borne in mind is that patients with high blood-pressure can safely take nitrous-oxide-oxygen, as under it the pulse is slowed and we have a temporary engorgement of blood in the capillaries, lessening the strain on the heart. The danger attendant upon struggling and excitement is avoided.

And lastly, a point that appeals to all concerned, the patient following the operation begins his fight for recovery immediately with full consciousness, with less shock, and with heart, kidneys, and lungs unimpaired—"literally without encumbrance."

OATMEAL GRUEL IN INFANT FEEDING.

As the *Medical Record* of November 10, 1917, points out, oats have always held a high reputation as a nutritive food for man and beast. Oats contain a higher percentage of carbohydrates and fat than other grains, and, moreover, the fat in oats is of better quality than that in other grains, and the iron content of oats is very high. Oatmeal gruel is an excellent food for infants, and was first used in this capacity by the French. At the present time, oats are being used extensively for well and sick adults, and especially for well and sick infants and children, in the form of oatmeal gruel.

Levinson, in the *Archives of Pediatrics*, gives the results of investigations taken by himself and colleagues as to the value of oats as an infant food. He summarizes as follows: (1) Oats is an important addition to infant food. (2) The most valuable preparation is oatmeal gruel. (3) The 5-per-cent mixture which contains 1.5671 gramme dry substance and equals 5.4 large calories in 100 Cc., is the most efficacious preparation. (4) Oatmeal gruel can be prepared very simply by washing grits in cold water and boiling for thirty minutes and then straining. (5) Gruel can be given at any age with beneficial results. (6) Its taking increases the appetite of the child. (7) It makes the stool homogeneous. (8) It often relieves constipation. (9) It has high iron content.

The experiments carried out by Levinson were mainly in order to find out if oatmeal gruel had a favorable effect upon the stool of infants. As will be observed above, the conclusions from this point of view were eminently satisfactory.

ON THE EFFECTS OF INJECTION OF HYPOPHYSEAL EXTRACTS (POSTERIOR LOBE AND PARS INTERMEDIA) IN THE TREATMENT OF DIABETES INSIPIDUS.

Barker and Mosenthal in the *Bulletin of the Johns Hopkins Hospital* for November, 1917, report on the effects of injection of the pars intermedia and of the posterior lobe of the hypophysis cerebri in controlling the symptoms in diabetes insipidus as illustrated by the case reported in this paper. The patient, a woman of middle age, had suffered from excessive thirst and extreme polyuria for several months. The urinary output was, at times, as much as 11 liters in the twenty-four hours. Work and sleep were seriously interfered with and the patient had become very nervous. The urine was of very low specific gravity, and the kidneys, as in similar cases, seemed unable to secrete a concentrated urine.

On subcutaneous administration of hypophyseal extracts (posterior lobe and pars intermedia) it was found possible completely to control both the polyuria and the polydipsia, and to raise the concentration of the urine to a normal level. Two doses of 1 Cc. each in the twenty-four hours were sufficient. The patient's nervousness was greatly mitigated and sleep returned. The only other effect noticeable was a movement of the bowels after each injection.

Many other forms of treatment were tried in this case, but without benefit.

Tethelin and adrenalin had no appreciable effect upon the polyuria.

The writers feel that their experience in this case is confirmatory of the reports of others who assert:

1. That diabetes insipidus is to be looked upon as an endocrinopathy, being due to an insufficiency of the pars intermedia of the hypophysis cerebri.

2. That the symptoms of diabetes insipidus can be controlled by a substitution therapy, namely, by the subcutaneous injection of extracts of the posterior lobe and pars intermedia of the hypophysis cerebri.

QUININE IDIOSYNCRASY IN FIVE CASES.

SINTON reports on five cases of quinine idiosyncrasy in the *Indian Medical Gazette* for September, 1917. He points out that MacGilchrist in his investigation of the cinchona derivatives found that the order of lethality of the cinchona alkaloids to guinea-pigs was (*a*) cinchonidine, (*b*) quinine, (*c*) cinchonine, and (*d*) quinidine, cinchonidine being the least lethal.

MacGilchist also found that "as regards unpleasant by-effects of these alkaloids buzzing in the ears was most frequently associated with quinine and quinoidine; amblyopia with quinine and cinchonine; diarrhea with cinchonine if administered over a week, and nausea with quinoidine. Cinchonidine even in large doses caused no unpleasantness of any kind."

A number of the above points are brought out in the cases recorded below:

Case I.—B. K., European, aged thirty years, suffering from malaria. On the first day of his illness he was seen with a temperature of 103° F., and had taken quinine acid hydrochloride 10 grains two hours previously. Another dose of 10 grains was given the same night.

On the second day the morning temperature was 100.4°, and 10 more grains of quinine were given. A similar dose was taken in the afternoon, and in the evening his temperature was 102.4°. It was then noticed that his face was slightly swollen, but as there were a lot of sand-flies about, it was thought that it might be due to their bites.

On the third day the temperature was normal, but as there was very marked edema of the face and eyelids and severe headache was complained of, the quinine was reduced to 10 grains daily and saline purgatives were given. The edema did not go down for several days.

In this case the idiosyncrasy took the form of a marked edema of the face and eyelids, although only 40 grains of quinine had been given in two days.

Case II.—B. S., Dogra, aged twenty-eight years. When the regiment was paraded for prophylactic quinine on service this man objected to taking it as he said he always got a rash all over his body and very severe headache after taking quinine. Quinine sulphate 10 grains was, however, given in tablet form, and in about one hour's time he returned to hospital complaining of great itching and had a very marked urticarial rash all over his body. This rash lasted for four or five hours and was accompanied by a very severe headache. The buzzing in his ears lasted two days.

Case III.—A. S., Mohammedan, aged thirty-eight years. After a dose of 5 grains of quinine sulphate in solution this man developed severe vomiting and diarrhea in about half-an-hour, and a diffuse urticarial rash appeared all over his body after one hour. This rash lasted five or six hours. He complained of vertigo and severe headache and stated that similar symptoms had developed on previous occasions when he had taken quinine.

As he had a malarial infection cinchonidine sulphate 5 grains was given; it produced a similar result but not in so marked a degree. His fever disappeared under treatment with tincture of cinchona, iron, and arsenic.

Case IV.—D. S., Sikh, aged twenty-two years. After the administration of quinine sulphate 5 grains he had severe vomiting

and diarrhea with profound prostration. An urticarial rash appeared all over his body and his eyes became very congested.

This case is of interest because cinchonidine sulphate in doses of 5 grains did not produce this effect.

Case V.—H. B., Jat, aged nineteen years. His history was that when given quinine as a prophylactic he had become semi-comatose and had severe vomiting and diarrhea.

Cinchonidine sulphate 5 grains was given in solution, and after fifteen minutes he was carried back to hospital in a collapsed condition. He was semi-comatose, his face and conjunctivæ were very congested, his pupils dilated, and his eyes turned up.

His skin was cold and clammy, his pulse imperceptible at the wrist, but heart-beats 80, and his temperature 95°. Vomiting and diarrhea were severe. An ounce of brandy was given and hot bottles applied. After about twenty minutes he became conscious and complained of chilliness and severe headache. In a few hours' time an urticarial rash appeared on his body. His urine contained no albumin or blood.

On the next day he had recovered except for headache and buzzing in the ears, which lasted several days.

This case was very similar in character to one described by Van Poole, except that in his case the pulse was rapid.

It is interesting to note that so small a dose of cinchonidine sulphate caused such a profound disturbance, although it is the least lethal of the cinchona alkaloids.

These last four cases seem to be typical of the toxic effects of quinine on a susceptible subject.

A REPORT OF 112 CASES OF CEREBRO-SPINAL FEVER.

In the course of an article in the *United States Naval Medical Bulletin* for October, 1917, MILLER and MARTIN make this report and give this advice:

Prophylaxis: Avoidance of overcrowding and dark, damp living quarters and prompt attention to colds and coryza are important. Swabbing with weak solution of iodine in glycerin of the nasopharynx of not only contacts but all persons in the epidemic area is a good practice and has been carried out at this hospital. All persons should be examined for carriers, and when found to be such should be treated. A 2-per-cent solution of chloramine in oil of eucalyptol has been found efficacious. Prophylaxis by means of vaccines was not attempted. Isolation was strictly practiced.

Curative measures: Diet should be light but nourishing during the acute stage, but should be increased as soon as appetite returns, as emaciation and prostration tend to become extreme.

Lumbar puncture: This is put down as a treatment in itself and not merely as preparatory to the administration of serum, for it is the opinion of the writers that it is a very important, if not the most important, part of the treatment. The relief is frequently instantaneous, and cases in active delirium have become rational in a few hours. Several cases received early were treated by this method only and convalesced quickly and uneventfully. Early diagnosis is most important, as a few hours' delay may change a mild case easily handled into a most grave or even fatal one. *In all cases of doubt a lumbar puncture should be done immediately.* Evidently a number of medical officers do not appreciate the necessity for prompt action, as cases are sometimes kept aboard ship without lumbar puncture but "under observation" for twenty-four hours or more when cerebro-spinal fever is suspected. Certainly every ship should be furnished at least the needles necessary for a lumbar puncture.

General anesthesia was not used, but ethyl chloride as a local anesthetic was employed as a routine measure and gave satisfaction. All spinal punctures were performed with patient lying on right or left side. The following position was found most convenient and satisfactory: Patient on side with back well over edge of bed, with an attendant who has back well up to abdomen of patient and with one arm firmly grasping patient's knees and the

other under patient's shoulders, carefully avoiding head and neck. This effectually prevents the struggling of a delirious patient and possible injury by breaking of needle.

Tincture of iodine painted over site of puncture was used as a routine measure, and no local infection resulted in any case. The third lumbar interspace was the point of election, but the fourth and second were used in a few cases for irrigating purposes.

Administration of antimeningococcic serum, when of sufficient degree of polyvalence, has given good results. Undoubtedly the disappointment experienced by some has resulted from the use of a serum in preparing which too few strains of meningococcus have been used. A polyvalent serum made from about 80 different strains of meningococci by the Rockefeller Institute was used and gave good results. It is given in this manner: In very acute cases from 20 to 40 Cc., according to the amount of spinal fluid withdrawn, are given every twelve hours until three doses have been injected, then every twenty-four hours, not only until the fluid is negative for meningococci, but for at least several days longer or until there is marked improvement in the patient's condition. It is most important to give this serum in less quantity than the fluid withdrawn; also to obtain the best results the canal should be drained thoroughly—*i.e.*, until the fluid ceases to run faster than normal (one drop every four seconds). It is equally important not to drain too rapidly, as this causes intense headache and increases the tendency to hemorrhage.

From this time lumbar puncture is done daily until the fluid becomes clear and there is no pressure. Frequently after active treatment has stopped it becomes necessary in a few days or even a week or more to tap to relieve pressure. Irrigation of the spinal canal with normal saline solution has been found of benefit in those cases with purulent fluid and in the long-continued cases. Morphia for the relief of pain and insomnia is required. Careful watch on the excretions is necessary, as retention of urine may occur. They conclude as follows:

1. The necessity of an early diagnosis with prompt institution of treatment.
2. Importance of thorough drainage of canal, done slowly, and of the introduction of serum, being careful not to administer as much and never more serum than fluid withdrawn.
3. Proper position of patient in bed must be obtained.
4. Always administer serum at body temperature.
5. Irrigate canal thoroughly with normal saline solution in cases whose spinal fluid is markedly purulent and those that have a recrudescence.
6. Employ careful swabbing of all contacts.
7. Watch for retention of urine.
8. Institute prompt treatment on the return of symptoms.
9. Isolate all cases.

SUBCONJUNCTIVAL INJECTIONS.

RIDLEY (quoted in the *Edinburgh Medical Journal* for September, 1917, from the *Birmingham Medical Review*, February, 1917) under this topic discusses the injection of fluid deeply into the cellular tissue of the orbit, the idea being to get a local effect of the drug by introducing it into the neighborhood of the part affected. This is a reason based on theory rather than any demonstrable proof. Rather it would seem that such injections cure the disease by the physiological process of locally stimulating a reaction of the blood and tissue against the invading cause. As to technique the patient is directed to look down and in. The conjunctiva is seized close to the outer canthus and a straight needle is plunged backward close to the outer wall of the orbit. With a drop of cocaine previously instilled and a sharp needle there is no pain in the procedure itself, but almost immediately after a severe aching comes on and lasts for from twenty minutes to two or three hours. It is best relieved by the application of firm bandages over an elastic pad of cotton-wool. The author enumerates a few of the conditions to which this

method of treatment is applicable, to wit: all cases of retinitis and choroiditis, due to attacks of microörganisms; iridocyclitis, keratitis, ulcers of cornea with hypopyon, and more chronic affections, such as retinitis pigmentosa, retrobulbar neuritis, optic atrophy, and corneal scars.

In his clinic subconjunctival injection was used as an adjunct to other treatment, and was administered at intervals of three or four days in acute cases, such as corneal ulcers with hypopyon; but only every week, fortnight, or even month in more chronic conditions, such as retinitis pigmentosa, where the treatment could be continued for years. Fifteen to twenty minims was a convenient dose, and a course of six injections was usually given, and then the patient had a rest for two or three weeks before beginning again. In the author's experience the most astonishing results had been seen in early central retinitis, where sometimes the patch at the macula had almost disappeared and the central vision recovered in a few weeks. Great improvement had been noted, too, in tubercular and syphilitic choroidoretinitis. Then results in retinitis pigmentosa had been very encouraging in at least checking the advance of the disease, while often a most marked improvement had taken place. In old patches of keratitis, corneal scars, and even in optic atrophy, some benefit had been produced; and, in fact, it was a common thing for patients to return begging to have another course, in spite of the pain occasioned, so convinced were they of the advantage resulting. The operation was so simple that it could be entrusted to an intelligent nurse who had seen it done once or twice. Of course there was a slight danger of injury to the globe, or the other orbital contents, in clumsy hands, or of formation of abscesses; but he had never seen anything of the kind happen, or, in fact, any mischief, in the thousands of times it had been practiced in his clinic. The only drawbacks were the pain, and occasionally considerable swelling and edema of the conjunctiva and lids. The latter soon subsided on application of cold compresses.

To sum up: In the author's opinion, subconjunctival injection was a very useful adjunct to other methods of treatment, and gave some hope in cases hitherto considered beyond help.

In commenting upon this paper Harries-Jones spoke warmly on the value of the treatment, stating that his favorite injection was 2-per-cent sodium chloride with 1:1000 cyanide of mercury, and that he regarded it as one of the best remedies used in ophthalmology.

Mr. Cridland was enthusiastic as to the beneficial results of the treatment, holding that it had helped in a number of cases in which nothing else seemed to be of the slightest avail.

TREATMENT OF SYPHILIS IN THE ARMY.

Under this title COLE (*Cleveland Medical Journal,* October, 1917) quotes Neisser to the effect that it would be possible to give weekly intramuscular injections of gray oil .25 grm. for five or six weeks, and along with this three intravenous injections of neosalvarsan .4 grm. to .9 grm., a week apart, following the technique devised by Ravaut and others. Neisser advised the treatment of all prostitutes, whether syphilitic or not, by salvarsan and the establishment of capable specialists in dermatology and syphilis for all base hospitals.

Cole believes that from the standpoint of the individual, of the army, of the public, and of the state's welfare, our freshly syphilized soldiers should be treated in special base hospitals for these cases. These hospitals should be under the direction of competent specialists in dermatology and syphilis, and have the laboratory facilities so essential for the early diagnosing and proper treatment of syphilis. Each hospital should have a dentist associated. The treatment should be of the most vigorous type and designed to clear up the patient's condition as soon as possible, to return him to the trenches as soon as possible, and yet to keep him out of the hospital as long as possible.

This can only be done by a series of six to eight salvarsan injections, five days to one week apart, accompanied by as much mercurial treatment as the patient can stand. This patient must later have some ambulatory mercurial treatment from time to time. If these measures are not carried out, innocent cases of syphilis will be very common among our soldiers; in the end there will be more sick days in the army, the army strength will not be at its maximum, and in the future the soldier, his family, and the state will have to suffer the consequence.

ANAPHYLATOXIN AND ANAPHYLAXIS.

During the past three years an intensive study of anaphylatoxin and anaphylaxis has been carried out in the Hygienic Laboratory of the University of Michigan, a short summary of which is herewith given.

It has been known for some years that the normal serum of the guinea-pig when incubated for some hours with various bacteria, trypanosomes, agar, starch, etc., acquired a poisonous property which was designated as anaphylatoxin because the effects suggested some relation to those observed in acute anaphylactic shock.

In the course of the work on the immunity of animals against the pathogenic trypanosomes it was frequently noted that repeated injections of the dead organism caused severe toxic symptoms and even possible death. Because of this complication it was not possible to produce a high degree of immunity in the treated animals. Hence it became necessary to ascertain the nature of this poisoning.

Accordingly, the relation of trypanosomes to anaphylatoxin production was studied, and this work led to similar investigations with agar, bacteria, peptone, etc. Two important facts were learned, and these proved to be of great value in the further study of the toxicity of normal blood and serum, and in that of specific anaphylactic shock.

In the first place it was found that the poison production occurred at great speed. Under proper conditions a harmless normal serum could be rendered fatally and acutely toxic in two or three minutes. This speed of poison production in the test-tube corresponds to that which actually obtains in anaphylactic shock. A second fact of equal importance was the recognition that rat serum was capable of yielding more anaphylatoxin than any other serum. Where workers hitherto have had to content themselves with a poison which killed in a dose of 2 or 3 cubic centimeters, it was possible to have one which caused acute death in a dose of 0.25 and even 0.15 cubic centimeter. With the powerful anaphylatoxin obtained from rat serum it was feasible to do some tests otherwise impossible.

Agar was used in much of the work on anaphylatoxin, and since the addition of this seemingly inert substance to a serum rendered it poisonous it was reasonable to suppose that the intravenous injection of agar would give rise to the same poison in the animal, and hence that an acute non-specific anaphylactic shock would be induced. This was found to be the case; acutely fatal, typical anaphylactic shock can be produced by injecting agar into guinea-pigs. Noteworthy is the fact that the amount of agar necessary to evoke a fatal shock is less than that of the pathogenic bacteria. And further, the immediate effects produced by an intravenous injection of bacteria are the same as those produced by injecting agar, or anaphylatoxin. Very rapid transfusion of blood from the heart of the animal which receives the agar injection into the vein of a new guinea-pig results in an acute fatal shock. In this way it was established that the agar acted in the animal in the same manner as in the test-tube—*i.e.*, it gave rise to anaphylatoxin.

It is to be noted then that agar produces the same poison as do bacteria. This poison hitherto has been supposed to be within the bacterial cell, and has therefore been called "endotoxin." The fact that agar can produce this same poison goes to show that the old view is fundamentally wrong.

It has been known for a long time that intravenous injection of peptone gave an

incoagulable blood, drop in blood-pressure, and even death. The similarity of these effects to those in acute anaphylactic shock has led to the view that in specific shock peptone or like products were formed and caused the toxic effects. Peptone is by no means as toxic as agar. It must be used in a dose several hundred times larger than the latter. It was possible to show that the addition of peptone to rat serum in the test-tube actually gave rise to anaphylatoxin; and further, the animal which received an injection of peptone, by blood transfusion, was shown to contain anaphylatoxin in its blood. In other words, the toxicity of peptone was due, like that of agar, to the production of anaphylatoxin.

A normal blood which in a given dose is perfectly harmless, provided it is injected at once, may become acutely fatal if it is kept in the syringe for about three minutes. This precoagulation toxicity is due not to the injection of fibrin ferment but to the formation of anaphylatoxin. After the removal of the clot some of this poison persists in the serum. Hence it is that a serum always possesses a certain degree of toxicity. The degree of toxicity depends to some extent upon the mode of defibrination. It may also depend upon conditions which affect the animal. Thus, perfectly normal rabbits will yield sera of varying toxicity; the serum of one may have no effect when injected in a dose of 6 Cc., while that of another may kill in a 1-Cc. dose. It is noteworthy that in cachectic conditions the toxicity of the blood is greatly increased.

In specific anaphylaxis where a guinea-pig which has received an injection of serum or egg-white is reinjected about two weeks later with a second dose of the same material, it was possible to show that anaphylatoxin is likewise produced. A rapid transfusion of the blood of the shocked animal reveals the presence of the poison. Similarly, when the serum of the sensitized animal is mixed with the antigen in the test-tube anaphylatoxin is produced within two or three minutes, the speed being the same as when agar or peptone is employed. Particularly important was the fact that the serum of a sensitized rat on dilution with distilled water and short incubation, yielded the same anaphylatoxin. This fact disproves the theories of absorption; it likewise disproves the view that the poison arises from the antigen.

It is evident that a new and broad principle underlies these phenomena. The blood is known to contain an unstable protein, fibrinogen, which readily changes into a tautomeric modification—*i.e.*, fibrin. A similar unstable body is the matrix of the poison. The catalyzing action of various substances and foreign cells readily changes this matrix into anaphylatoxin. Hence the importance of recognizing the fact that more or less poison may be formed in the circulation. If the amount is large it may lead to shock effects similar to those in eclampsia; the continued action of small amounts may lead to cachexia and like conditions.

The fact that the addition of sodium carbonate to a serum renders it incapable of producing anaphylatoxin, and the further fact that the addition of this alkali to anaphylatoxin itself tends to destroy it, may serve as a basis for the rational use of alkali as a curative and preventive agent in those conditions which are due to the blood disturbances in which this poison forms. This condition of the blood due to anaphylatoxin or taraxin may be designated as taraxy.—*Surgery, Gynecology and Obstetrics,* October, 1917.

WAR INJURIES OF THE JAWS.

BENNETT (*The Practitioner,* September, 1917) observes that war fractures differ from peace fractures in one particular, namely, the loss of more or less bone, and this factor so affects the treatment as to have rendered earlier methods often inapplicable, and to have constituted a fresh problem for solution. The first consideration is hemorrhage, applying chiefly to cases seen shortly after injury. Thereafter comes support of fractured portions of the mandible and abatement of sepsis. The use of an aluminum chin support held in place

by a bandage, but without much pressure, is advised. Sepsis is best controlled by almost constant irrigation with a mild antiseptic. Loose teeth, broken teeth, foreign bodies, loose pieces of dead bone, and septic roots should be removed, as well as the teeth in the immediate vicinity of the fracture, to which rule there are exceptions, since even a loose or broken tooth may be of great value temporarily, even though it be extracted later.

There is a group of cases in which the anterior portion of the mandible with the teeth contained therein, even as far back as the premolars, or even the molars, is destroyed. There is an immediate inward displacement of the lateral halves, which if uncorrected makes a parrot-shaped mouth and renders further mastication impossible, even impairing speech. There is a second group, including fractures in the premolar or molar region anterior to the masseter. Sometimes this is double; more often single, and associated with damage to the maxillary teeth on the opposite side, when the path of the bullet has not been quite horizontal. In the case of double fracture, the center fragment is usually depressed, and the lateral fragments are drawn upward and inward.

The third group consists of fractures at the angle, or of the ascending ramus, or coronoid process, or even of the neck of the condyle. Injuries high enough to destroy the condyle itself are usually fatal. The amount of bone destroyed determines to some extent the ultimate results to be attained, therefore the methods to be employed. With loss of bone up to half an inch in length bony union may be expected with some confidence. With a loss up to three-quarters of an inch, or even more, it is not impossible, under favorable conditions, without the aid of a bone-graft. Beyond that length replacement by natural growth cannot be expected, and the initial course of treatment is to some extent determined by the intention to make use of a bone-graft ultimately. Larger losses involving most of one side of the horizontal ramus are probably beyond the aid of a bone-graft.

In the case of the less severe injuries of the mandible in front of the anterior border of the masseter, displacement is immediate, and is rapidly increased by muscular traction. The first treatment is to correct the displacement with or without the aid of an anesthetic and to fix the parts firmly by means of an intraoral splint or by wiring the mandibular teeth to the maxillary teeth; or to employ appliances that will gradually reduce the displacement, and then to fix as before.

A variation of the latter method consists in reducing the displacement under an anesthetic step by step, a little at a time, at intervals of a few days, and wiring the parts temporarily each time until normal position is attained.

Ameliorating methods may be applied when the destruction of bone is small; gradual methods in cases of large destruction or in old cases. Those cases in which most of one side of the jaw is missing call for treatment which should prevent the sound side from deviating toward the injury. After repair has taken place it is remarkable what force can be exerted in mastication by half a jaw. The author reports an instance in which this treatment was adopted, and a removable gold and vulcanite appliance for mastication, with engaging plane to keep the half-jaw in position, was inserted, with satisfactory results. Concerning the question as to whether it is desirable to sacrifice contour and occlusion in order to obtain bony union it is the author's opinion that this should not be done.

It may fairly be said that when normal position has been sacrificed to only a slight extent, bony union could usually have been obtained without such sacrifice; and that where by such means bony union is obtained that would otherwise have been unobtainable, then the contraction is so great that the jaw is less useful than would be obtained by firm fibrous union in good position.

It is, perhaps, desirable to point out that this question of dental occlusion is far from being an academic one, or only of esthetic interest. Any considerable displacement of the parts means that only a very few teeth

will meet at all, and the chief function of the mandible is almost destroyed. It might be thought that as so many teeth are usually lost in any case, the extraction of a few more and the insertion of artificial substitutes would overcome the difficulty. It is unfortunately true, however, that contraction of the mandible or deviation to one side so alters the relationship of the alveolar arches as to cause much difficulty in the fitting of artificial dentures, and to impair their efficiency.

There is, however, one form of displacement that materially assists bony union and does not cause loss of occlusion of any moment. In those cases of unilateral fracture through the molar region previously referred to, the larger fragment deviates toward the injured side. This displacement can be corrected, leaving a space between the fractured ends. What usually then happens is, that the smaller fragment is drawn forward and upward and closes the gap, allowing bony union to take place easily if the parts are firmly held. Externally there is little visible defect beyond a diminution of prominence of the angle of the jaw. It may be desirable to extract an upper molar or two to permit of this movement, but this is not always necessary. In fractures anterior to the first molar, this method of treatment involves a shortening of the alveolar arches on the affected side, and it is questionable how far the forward movement should be permitted. On the other hand, in fractures anywhere near the angle, if no tooth remains in the smaller fragment, it is fortunate that the forward movement is beneficial, for it is somewhat difficult to prevent. An excessive extent of this movement in a case of non-union of long standing is given.

When the fracture is behind the anterior border of the masseter, there is little or no displacement, and it is usually sufficient—in the early stages—to keep the mandible closed in normal occlusion by suitable bandaging, or by other methods. Mr. Colyer says that in fractures of the ascending ramus the elevating muscles on the injured side cause an upward tilt on that side with separation of the teeth on the uninjured side. This can be corrected by gagging the teeth on the injured side and applying upward pressure externally to the mandible. In cases of fracture high in the ascending ramus near the neck of the condyle, two undesirable possibilities present themselves: false union, or true union with stiffness at the joint. Complete immobilization is required until the fracture is partly consolidated, after which the mandible should be gradually opened and exercised by passive movements, and massage used in the region of the condyle. Immobilization for too long would probably result in fibrous or even bony ankylosis.

Almost all fractures anterior to the masseter involve displacement. Gradual reduction and immobilization following immediate or gradual reduction usually involve the use of an appliance. The method of wiring the ends of the fragments must be condemned. In ordinary fractures without loss of bone it has been sometimes successful, but if used for war injuries one of two evils almost inevitably follows: most usually, on account of sepsis, which cannot be adequately controlled, the ends of the bone necrose and the wire loosens. If this should not happen, and union takes place, the result will be a union in false position.

COSMETICALLY PERFECT CIRCUMCISION.

Millstone (*Medical Record*, Oct. 20, 1917) very aptly warns the profession that they cannot attain perfection in this operation unless they have vividly before them the fact that they are doing a prepucectomy and not a prepucotomy, and moreover makes a most diverting plea for the preservation of the frenum, regarding this structure as the "spoke essential in the erector cycle." He prefers local anesthesia and describes a method quite his own, which consists in injecting a half per cent novocaine solution in the quantity of five drops about the urethra by means of a needle thrust through the overlying tissue. The prepuce is then seized in mosquito forceps

near the mucocutaneous junction on each side and drawn far out; a clamp is passed along each side of each mosquito forceps and carried down to the corona and locked. The prepuce is split between the grip of these two clamps, and another clamp which is described as similar to that used in resection of the stomach is then placed close to the coronary sulcus at the base of each quadrilateral skin flap for the purpose of leaving no tags. Sutures are placed and the clamp is removed without ligating anything. The dressing is applied by means of a half-inch bandage dipped in melted oxide of zinc ointment and rolled around the line of incision a few times. A dry dressing is placed over this. The author claims for this operation great simplicity, crowning beauty both in the immediate and final results, and speediness. There are a number of alluring illustrations which but add to one's desire to see the operation really performed.

FOREIGN BODY IN THE EYE.

CURRAN (*Boston Medical and Surgical Journal,* Sept. 27, 1917) states that at the Norton Company during the past year there were treated 1300 cases of injury to the eye. Of these 90 per cent were directly attributable to foreign bodies. By the rules of the factory the employees are forbidden to treat each other's eyes, and every man is required to report at the shop hospital for every accident, however trivial. The method of examining the eyes is as follows: First, inspect the lower conjunctival sac. This can be done by simply pulling down the lower lid and telling the patient to look up, thus exposing the whole conjunctival surface. Then take the upper lid. Here it is necessary to evert the lid in order to expose the whole conjunctival surface. The ease with which this can be done depends upon the experience and consequent dexterity of the surgeon. To do this easily, have the patient look down, grasp the lashes of the upper lid, place an applicator at the base of the tarsal cartilage and evert lid, thus exposing the entire fornix.

The cornea is then carefully searched with the naked eye; with a glass aided by a condensed light. If there be difficulty in the examination this will be remedied by instilling two drops of a 4-per-cent solution of cocaine. Pigment spots in the iris and pigment stains on the cornea may cause some doubt. If a foreign body becomes embedded on the cornea it always leaves a pigment stain, or so-called rust spot. This rust spot disappears in forty-eight hours after removal of the foreign body. A cotton-wound applicator usually removes foreign bodies lying loose in the conjunctival sac. Thereafter 20 drops of a 2-per-cent solution of argyrol are instilled and the patient discharged.

Embedded foreign bodies, whether they are situated on the cornea or sclera, always necessitate the use of an anesthetic, 4 per cent of cocaine being the best. A corneal spud then enables the operator to remove the body. If the latter be large and deeply embedded a spear-headed spud is the instrument of choice. With small foreign bodies deeply embedded it is best to use a Graeffe cataract knife. Thereafter hot compresses are used at home, the patient being given two drops of a 1-per-cent atropine to put the eye at rest. The number of accidents have been reduced to a minimum by the use of goggles, which should always be worn in work involving grinding or chipping, and where sparks or dust result from the operation.

TREATMENT OF WOUNDS INFECTED WITH BACILLUS PYOCYANEUS.

TURNER and RICHARDSON (*British Medical Journal,* Sept. 29, 1917) thus describe the characters of the infected wound and the condition of the patient:

The suppuration is profuse, and it has a characteristic bluish-green color which varies considerably in shade, and which stains the dressings and also very often the patient's skin.

There is a characteristic offensive, musty odor.

When this infection appears it tends to

extend to other wounds in the same ward, although careful precautions are taken.

When it has once appeared in a wound it is very difficult to eradicate, and the healing of the wound is often greatly impeded.

There may be an intractable diarrhea due to infection of the intestinal tract, presumably of septicemic origin, and in one case recently B. pyocyaneus has been isolated from the blood.

As a result of the prolonged suppuration there may be considerable weakness and anemia.

Owing to the above facts wounds infected with this organism have been in some hospitals isolated and treated in separate wards. The infection is not dangerous to life, and as a rule eventually the cases do well. Indeed it would appear in most cases that the wound must be granulating and showing signs of repair before the organism can grow sufficiently freely to produce the characteristic pus. Many cases in which routine bacteriological examination of pus shows B. pyocyaneus without clinical signs of infection have later quite suddenly discharged pus of characteristic color and odor. Hence the infection frequently appears in wounds that are regarded as doing well, but in which the local condition is favorable for the growth of the B. pyocyaneus.

They advise the following treatment: As soon as a wound is suspected to be infected a specimen of the pus is sent to the pathological laboratory for examination. If the clinical signs are definite, treatment by hot eusol fomentations is commenced at once. In a doubtful case the result of the examination may be awaited.

The fomentations must be of sufficient thickness and size; they must be as hot as the patient can stand, and must be changed four-hourly. A 5-per-cent solution of eusol heated to boiling point is employed. The wringer should be of canvas or strong calico, since ordinary wringers of linen or flannel are rapidly destroyed.

When the wound is deep or sinus-like, or when a slight coloration persists, the wound may be syringed twice daily with eusol as hot as the patient can bear, or packs of eupad powder wrapped in gauze and moistened with hot eusol may be employed in addition to the fomentations. The latter is often very effective.

Frequently the odor and color will completely disappear in twenty-four hours or less, but the fomentations should always be continued for at least three or four days after the disappearance of the clinical signs.

When the fomentations are omitted, eusol or saline soaks may be used; but if there is a return of color and odor, treatment by fomentations must be resumed.

A bacteriological examination of the pus should be made every two or three days as a guide to treatment. Cases in which the clinical signs of the infection are absent but the organism is found on bacteriological examination are probably harmless, but it is wise in these cases to continue the eusol fomentations for a long period.

ETHER OIL ANESTHESIA BY THE RECTUM.

PAGE (*Lancet*, Oct. 27, 1917) gives credit for this method to Dr. Gwathmey. Since 1914 he has used it for the wounded in the case of plastic face and jaw operations. The technique is as follows:

A simple wash-out of the bowel an hour or two before the injection, in addition to the usual preliminary dose of medicine, is an advantage, but can be dispensed with if necessary. A subcutaneous injection of morphine gr. ¼, atropine gr. 1/100, is given half an hour before the time fixed for the ether-oil injection. He has used the paraldehyde rectal injections, but prefers morphine subcutaneously. From 20 to 25 minutes before the time of operation 6 ounces of a mixture containing two parts of ether to one of oil (ether 4 ounces, oil 2 ounces) are slowly run into the rectum. Six minutes are spent in making this injection. The india-rubber catheter is passed 3 or 4 inches into the rectum, never more than 4 inches.

When the operation is finished the remaining ether-oil must be washed out, using a large rectal tube and funnel. The

wash-out must be done thoroughly and methodically, as on this depends the rapidity with which the patient recovers consciousness. He does the washing out, unless he has shown a nurse how to do it. The tube is gradually passed up and as much as possible of the remaining ether-oil mixture withdrawn. The tube is then drawn down again near the anus, and some water or saline is run in and siphoned off. This is repeated gradually higher up the bowel until no oil or ether can be detected in the returning fluid, when the tube is gradually withdrawn lower, and 3 ounces of olive oil are passed in and left there. The temperature of the water or saline must not be above that of the rectum—in fact, only the chill off.

Following the use of this technique there have been no rectal, pulmonary, or gastric sequelæ. The return of consciousness is not delayed when the washing out is done satisfactorily.

Soldiers, unless they are very ill, are resistant to the effects of ether, and there is also the loss of ether in the breath, from the venous blood as it passes through the lungs, so that to produce a full anesthesia in a reasonable time it is often necessary to administer a little ether with a Clover apparatus and allow some rebreathing; if preferred, ether by the open method or some A. C. E. can be given. If it has not been possible to give the injection 20 minutes before the time for operating, some anesthetic vapor by the mouth will certainly be necessary for induction to prevent delay. After surgical anesthesia has been produced nothing more will be required by the mouth in a large number of cases. The anesthesia obtained is quiet and even and the laryngeal reflex is present. In some cases an occasional whiff of chloroform must be given with a Junker apparatus, but of course much less chloroform is required than with the usual methods, and there is the continual even stimulation from the ether absorbed from the rectum, so that with ordinary care there is practically no increased danger.

He has used it in 47 cases altogether. Two cases died, both with laminectomies. They perished immediately following operation, the cause of death being ascending myelitis. In two of his early cases in which he used 75 per cent of ether, there was rectal irritation. In the other cases there was looseness of the bowel for a couple of days; since then he has never used a stronger solution than 2 to 1. He notes that postanesthetic vomiting is less frequent than with other methods.

THE CURE OF INGUINAL HERNIA.

HULL (*British Medical Journal*, Oct. 27, 1917) describes a technique applicable to certain cases of oblique inguinal hernia, although he himself uses it much more generally. Local anesthesia possesses great advantages over general anesthesia for hernia operations. A half-per-cent solution of novocaine, to which a small quantity of adrenalin is added, is used. The needle of the analgesia syringe is entered at a point midway between the anterior superior iliac spine and the spine of the pubes half an inch above Poupart's ligament. The whole anesthesia is conducted through this puncture without withdrawing the needle. An incision from half an inch to an inch in length is made over the needle puncture and carried down to the aponeurosis of the external oblique. The fibers of the external oblique are split for a distance of half an inch. The opening in the external oblique should lie directly over the spermatic cord. The cremasteric and spermatic fascial coverings of the cord are drawn through the aperture of the external oblique. The cremasteric fibers are separated and the spermatic fascia incised; the sac is then found lying inside these coverings. Two pairs of fine hemostatic forceps (Halstead's mosquito forceps) are placed upon the edge of the sac, and an incision, half an inch in extent, made between them by a snip of a pair of scissors. The two layers of the sac forming the lips of the aperture are now clipped with hemostatic forceps. The aperture can now be held open by four pairs of forceps, and four incisions are

made, one between each pair of forceps, enlarging the aperture sufficiently to display the interior. If omentum lies in the sac it is drawn out, ligatured, and cut off. The interior of the sac presents for examination two apertures, one the internal ring passing into the abdomen, the other passing down the inguinal canal. These apertures are separated from one another by a process of peritoneum, the "crista"; in a well-marked case the apertures resemble the muzzle of a double-barrel shotgun.

The process of peritoneum called the crista corresponds to the internal margin of the internal ring. Forceps are clipped onto the crista in one or two places. It is now necessary to separate the important tube of peritoneum leading into the abdomen (the neck of the sac) from the unimportant tube leading down the inguinal canal. This is done by cutting along the crista to the mesial side of the forceps, and dividing one layer of peritoneum with scissors. As the result of this incision the neck of the sac now lies clear, held by the forceps on the crista on its mesial side, and the forceps on the outer side of the sac. The neck of the sac has in this way been completely exposed and freed without dissection. A gauze swab is gently passed down the outer and inner side of the sac. A gentle pull is made upon the neck of the sac whilst it is ligatured as high up as possible. It will be remembered that the crista corresponds to the internal ring, and by separating the crista forming the neck of the sac in the manner described above, and pulling upon the sac, it has become possible to ligature the peritoneum, forming the neck of the sac, about two inches above the internal ring. It is unnecessary and undesirable to perform any displacing maneuver to the neck of the sac. When the sac is cut off distal to the ligature, the elasticity of the peritoneum will displace the ligatured sac well behind the rectus muscle. In 90 per cent of cases this is all that it is necessary to do, and the skin incision is sutured with silkworm-gut passing down to, and taking up the edge of, the external oblique. In cases in which a large internal ring or very thin peritoneum renders a recurrence more possible, the conjoined tendon is drawn over the cord and sutured to Poupart's ligament without enlarging the wound. In exceptional cases it may be considered desirable for similar reasons to convert the operation into a typical Bassini operation. This can be done with ease by enlarging the split in the external oblique for another inch or more, lifting the cord, and suturing the conjoined tendon of the internal oblique and transversalis beneath it to Poupart's ligament. Experience has shown that when a recurrence takes place it is usually an immediate recurrence. The recurrence occurring immediately when the patient gets up is due to faulty ligature of the neck of the sac. The elastic peritoneum, released after ligature of the aperture, is very liable to slip the ligature. This cannot occur if the aperture formed by the neck of the sac is sewn in addition to simply tying the ligature.

The majority of herniæ occurring in men of military age are small bubonoceles or congenital herniæ containing omentum.

This operation is of particular value when dealing with cases of recurrent hernia. The new operation is performed above the matted scar tissue of the old operation and completed by Bassini's method almost with as much ease as a primary operation.

POTASSIUM PERMANGANATE IN THE TREATMENT OF ANAEROBIC INFECTION OF WOUNDS.

GURD (*Journal of the Royal Army Medical Corps*, August, 1917) notes that if the projectiles themselves be excluded, the chief danger to the soldier in France and Belgium arises from the activity of the anaerobic facultative parasitic microörganisms, particularly the Bacillus aerogenes capsulatus.

In the treatment of severe lacerated wounds certain operative and mechanical procedures are essential; these comprise:

(*a*) Arrest of hemorrhage—vascular and capillary.

(*b*) Provision for the evacuation from cavities of blood and transudates; adequate drainage.

(*c*) Excision of all obviously devitalized

tissue, whether such tissue has been killed by the force of the projectile, interference with blood supply, or by the activity of gangrene-producing microörganisms.

(*d*) Proper posturing and adequate splinting.

(*e*) Conservation of circulation.

In many, perhaps the majority of cases, such treatment will suffice; and unless these measures are conscientiously carried out, supplementary treatment will avail but little. There is, unfortunately, a large percentage of cases in which, owing to various causes, these operative and mechanical measures prove inadequate, and for which some solution having a bactericidal or inhibiting effect upon the bacilli must be employed.

Both eusol and saline solutions have been employed, but owing to the satisfactory results obtained with permanganate this preparation has been made use of with increasing regularity.

Reasons for the employment of potassium permanganate in the dressing of severe lacerated wounds and of gas gangrene infection may be tabulated as follows:

It is inexpensive, even at its present increased price.

It is a powerful oxidizing agent.

It is an effective germicide (even in dilutions much greater than may be profitably employed).

It is astringent, thus acting as a hemostatic, minimizing oozing and controlling the development of interstitial edema.

It does not macerate epithelium nor other tissues.

It is a mild irritant in the dilutions employed, and hence stimulates the circulation of blood through adjacent tissues.

It causes but little pain.

It induces the prompt appearance of firm, healthy granulations and the early separation of sloughs.

It does not stain nor otherwise alter the appearance of tissues other than those which are necrotic.

The chief objection to the employment of the drug is that it is dirty and renders both dressing and bed linen unsightly.

Certain precautions in its employment are necessary. Solutions must be prepared at least once daily. Water above a temperature of 110° F. should not be used in preparing the solution, nor should the solution be heated above this point. When hydrogen peroxide has been employed as a cleansing fluid this should be washed off with saline or an excess of potassium permanganate before the dressing is applied.

A solution of two or three per cent is applied in dressing patients who are under an anesthetic, while for patients who are conscious a solution of one-half to one per cent is less irritating. The burning sensation, of which some patients complain, is of very short duration, passing off in five minutes, or even less.

In applying the dressing it is important that a sufficiently large one be employed. The author used loosely shaken-out gauze soaked in the solution to fill in all cavities and crevices in the wound. Through this gauze numerous small rubber tubes protrude. Several thicknesses of gauze cover the surface of the wound. Over this is placed one or two thicknesses of cotton-wool also soaked in the solution. The whole is then covered with jaconet or with dry cotton-wool. Owing to the absence of maceration an impermeable covering may be employed with advantage in many cases.

Dressing should be changed more or less frequently, depending upon the nature of the case. It is unusual for it to be necessary to change the dressing next to the wound more frequently than once in twenty-four hours.

As a rule, it has been found useful to repeat the permanganate dressing for four or five days, although not infrequently, even in cases in which gross gangrene has been present, two dressings suffice to arrest infection and prepare the wound for treatment by means of some bland dressing such as saline or boric acid.

In the treatment of those parts of the body which can be advantageously treated by baths, potassium permanganate in dilutions of 1 to 200 to 1 to 500 is used.

ARTIFICIAL LIMBS AND THEIR INFLUENCE UPON METHODS OF AMPUTATION.

LITTLE (*British Medical Journal,* Oct. 27, 1917) observes that in order to make a good limb, the surgeon and the limb-maker must have some knowledge of each other's limitations. In the lower extremity end pressure and leverage are the strains to which the limb is most exposed. In the upper extremity prehension and traction are required.

The weight is borne in two ways, often, or generally, combined: by direct pressure of a part of the body downwards, such as on the end of the stump, or on a convenient bony process such as the tuberosity of the ischium; or by oblique pressure, as when the artificial socket forms a more or less conical cavity into which a conical portion of the body fits.

Leverage is exerted by the lateral surface of the stump pressing against the side of the surrounding socket.

An ideal amputation stump would be as long as possible, it would be covered by sound movable soft parts, the scar would be placed in a position where it would not be exposed to pressure, and it would not be adherent to the bone. It would have enough muscles attached to it to move it with adequate force, and no inflamed or hypersensitive nerve ends would be palpable in it.

The end or ends of the bone or bones would be rounded so as not to hurt the soft parts under them, and the blood supply would be free and the skin well nourished.

At first sight it would appear that this ideal is most nearly approached by an exarticulation, which preserves the full length of the limb segment, and does not involve any section of bone with its possibilities of infection and necrosis. Further consideration and experience of modern artificial limbs lead to the conclusion that, except in the cases of the hip and shoulder, exarticulations are to be avoided, and that amputation through the limb segment above the joint is to be preferred.

The following weighty objections to amputations through joints have been made and, as the author thinks, may be accepted as valid:

The articular enlargement, which is a prominent feature of all long bones, makes the resulting stump bulbous in form, a form which becomes more marked as atrophy of muscles goes on, leaving the dimensions of the bone unaltered. Such a bulbous stump, larger in girth at its lower extremity than at its middle, cannot be closely fitted with a rigid socket, such as forms the best support. Also the artificial limb must be wider than the natural one by the thickness of the walls of the socket.

The artificial joint must either be fitted below its proper level or else it must be placed on the sides of the bone end, and the limb must be still wider than its fellow and consequently unsightly.

To cover the articular enlargement extensive flaps are needed, and these must sometimes be of thin skin. Such flaps are often deficient in vitality and likely to slough.

In the lower extremity a stump capable of bearing some at least of the body weight on its end should be aimed at. Every pound of pressure here means less pressure on other parts, which in some cases do not bear it well.

An analysis of the records of 549 cases of amputation of the lower extremity seen recently at Roehampton shows that in 275 of these—almost exactly half—it was found advisable to fit an end-bearing pad. As might be expected, the proportion varied widely in the different regions. In the upper third of the thigh only 9 per cent were thus fitted, in the middle third 32 per cent, in the lower third 77 per cent.

The surgeon who has to deal with many of these end results cannot fail to be struck by the prevalence of wide adherent scars in the upper two-thirds of the thigh. Some of these, not many, are unmodified guillotine operations; the majority are not, and many are, the results of later operations in which attempts have been made in vain to produce a stump covered by sound skin. Some of

these unfortunate persons have suffered as many as seven amputations on the same limb.

In the upper extremity the question of end pressure does not arise, and here the condition of the lower part of the anterior and external surfaces of the stump is of most importance, because these surfaces have to take much of the pressure of the leverage action on the bucket. Many arm stumps with large adherent guillotine scars covering the end of the bone have been found to be quite satisfactory in practice.

The presence of osteophytes is rarely any hindrance. These are seldom large, except in the thigh, and they are usually situated about the femoral insertions of the adductor muscles, which are not exposed to much pressure.

In exarticulation at the shoulder the lines of scar should avoid the clavicle and the prominent bony ridges of the acromion, etc., for on these the shoulder-cap must press.

Amputations in the upper third of the arm offer very little hold for the socket of an artificial limb. Owing to the arrangement of the muscular attachments around the joint the upper three inches of humerus, or even more, are unavailable, and as in the arm of average length the upper third is only a little over four inches long, very little is available even in an amputation at the junction of the upper and middle thirds. A good deal can be gained by removing wholly or in part the folds of the axilla—that is, the pectoralis major and the terres major. This has been done with good result and seems to be an operation worth doing in suitable cases. The latissimus dorsi has not been interfered with so far as the author knows. It is less in the way than the other two muscles.

A gain of one inch of stump here is of the very greatest value, and as large adherent scars covering the end of the bone are comparatively unobjectionable in the arm, the surgeon in amputating above the middle of the shaft of the humerus should save as much bone as possible, even though there may not be skin enough to cover it completely.

The drag upon the adherent scar, which gives trouble in the lower extremity, is seldom complained of in the upper, owing to the absence of much upward thrust.

The objections to amputations through joints in general apply to the elbow with particular force, owing to the shape of the bones. If it is impossible to get a forearm stump extending at least an inch and a half below the insertion of the tendon of the biceps, amputation above the condyles of the humerus is to be preferred.

Similar considerations are of weight here to those mentioned in discussing the shoulder region. The action of the biceps tendon, which tends to throw off the bucket when it contracts in flexion, is one of the chief difficulties in these short forearm stumps. Unfortunately, this tendon cannot be spared, and its removal is out of the question. The remains of the bellies of the flexor muscles, however, are of no use, and have been removed in some cases with more or less advantage, enabling a better grip on the stump to be obtained.

The middle third of the forearm gives good stumps, but the lower third is not a favorable site. Many stumps here are cold and cyanotic and the skin tightly stretched and adherent. Moreover, the ends of the bones are often tightly soldered together by fibrous tissue or even bone, and the movements of pronation and supination are lost.

It is true that the most directly acting pronator, the quadratus, is sacrificed if the lower third is removed, but experience leads to the conclusion that good voluntary movement is possible without it, if the ends of the radius and ulna are free. It takes some time and practice, however, to enable the patient to carry out these movements, even when fitted with a suitable arm. The tendency is to use the shoulder-joint instead of the radio-ulnar.

Below the wrist, if the carpus and base of the metacarpus can be saved, it is worth while, provided movement is preserved. The short stump thus formed can be used

to actuate a movable thumb with considerable force by means of a simple appliance. It is a commonplace of surgery that any part of a finger or thumb is worth saving. If one active finger or a thumb is left it is easy to fit a stump to which it can be opposed and thus to give the picking-up action and the power of holding a pen.

In the lower extremity exarticulation or amputation between the trochanters is better than amputation in the upper third of the thigh. The upper third, anatomically speaking, in the average limb includes a little more than six inches of femur, which gives only three or four inches of stump below the pubes. Such a short stump is unable to move the lever formed by the thigh bucket with sufficient force no matter how light the limb may be.

Such improvements have been made in fitting what is rather inaptly called a "tilting table" that patients who have tried both the ordinary thigh bucket and this appliance usually declare that the latter is much the best. Certainly they walk better in it. This form of prosthesis forms one of the greatest improvements in artificial limb-making during the war.

In the middle and lower thirds of the thigh the general considerations apply which have been outlined. The middle third is the site of nearly half the amputations of the lower extremity treated recently at Roehampton. The exact figure is 42.8 per cent. No other region approaches this in frequency, the next being the lower third of the thigh and the middle third of the leg, each with 11.6 per cent only.

In this region the objects aimed at should be a non-adherent scar behind the bone, and a good disposition of the muscular masses on the inner side. If the great adductor muscles are allowed to retract too much a too conical stump results, and the bunch of soft parts at the top of the thigh just below the pubes forms a serious obstacle to the fitting of a socket. The tendons and fasciæ should therefore be sutured if possible over but at least near to the end of the bone.

In this relation it may be worth while to recall that the femur on a thigh stump is eccentrically placed. It is almost subcutaneous along the outer side of the thigh, and most of the lateral pressure of the artificial limb is borne on this outer surface. This position is very obvious on *x*-ray plates. Therefore in making incisions preliminary to or during amputation this surface should be spared if possible.

One of the greatest troubles of the orthopedic surgeon and the limb-maker is the prevalence of flexion contraction of the hip in cases of thigh amputation. In treating such serious injuries it is natural that the primary consideration should be the early and complete healing of the wound. To secure this and for the comfort of the patient the stump is often propped up upon a pillow, thus favoring shortening of the flexors of the hip. This contraction, unless very severe, is masked by a compensatory lordosis and often unsuspected by those concerned, but when the patient is examined with the sound thigh well flexed upon the abdomen the true state of affairs is revealed.

Practically every case of amputation of the thigh which was admitted to Queen Mary's Hospital at Roehampton was found to have some flexion contraction, or diminution of the normal range of hyperextension, and had to undergo a course of massage and passive motion, or the operation of tenotomy and fasciotomy, before a leg could be satisfactorily fitted. The structures most concerned are the tensor fasciæ femoris, the long adductors, the iliopsoas, and sometimes even the capsule of the hip-joint.

It is much to be wished that, in every case in which the general conditions are favorable, the stump should be fully extended, while the opposite thigh is fully flexed upon the abdomen at least once daily during treatment of amputations in this region.

The lower third of the thigh, just above the condyles, offers the best thigh stump for fitting with an artificial limb. If a long anterior flap is made, even though there may be an adherent scar behind the bone, a

good end-bearing stump often results. If the patella can be securely fixed to the end of the bone so much the better.

The general objections to exarticulations apply to the knee-joint. Not many such stumps are satisfactory.

In the leg below the knee the most favorable site is the lower part of the middle third. The old seat of election about four inches below the joint was intended for kneeling legs. Nowadays kneeling legs are avoided and only used when a stump below the knee is too short to work a socket. With skilled fitting, however, even very short stumps are useful. A good gait has been obtained with as little as two and a half inches of tibia, but this was an exceptional case. Rarely is a good result obtained with less than three inches, and then generally the stump should be capable of end-bearing. Much depends on the bulk of the soft parts. When these are voluminous the difficulty is increased.

These short leg stumps give a better gait than is got with a kneeling leg, and the artificial limb is less unsightly. Amputation in the lower third of the leg seldom gives a satisfactory stump. The bone surface at the end is too small for good weight-bearing, and the skin is often badly nourished, cold, and cyanotic.

No one can deal with many below-knee stumps without being struck by the frequency with which the fibula is cut longer than the tibia. This constitutes an obstacle to successful fitting. The fibula bears pressure on its end very ill, and often it wobbles about and is insecure.

Although many patients with Syme's amputation ask to have one performed higher up, it is deserving of its great reputation. If properly done it gives a painless weight-bearing stump. The bones should be sawn through well above the internal malleolus so as to avoid too bulbous a stump, and care should be taken to make the section at right angles to the often incurved lower fourth. Otherwise a varus stump is likely to result. Too low a section leaves no room for a strong transverse ankle-joint, and a too voluminous heel-flap means an unsightly artificial foot and boot.

Chopart's amputation gives a good bearing surface, but generally the calf muscles pull up the heel and tilt the lower end downward, and painful pressure on the scar results. The stump is too short to give a spring to the gait, and it is well-nigh impossible to fix any prolongation onto it. It has no advantage over a Syme, and the author submits that if the metatarsus cannot be saved nothing below a Syme is worth doing.

Elmslie in the same publication, as an orthopedist, commenting upon the side of the work which should be taken up by the fitter of artificial limbs, states that, in general, end-bearing, either complete or partial, may be expected when the bone section is thoroughly cancellous bone, when the bone is covered with thick skin and muscle or fascia, and when the skin over the stump is itself naturally adapted to weight-bearing. The type of end-bearing stump is that given by Syme's amputation. The other bearings used should be those upon the tuberosity of the ischium and upon the head of the tibia. Although a certain amount of bearing may be taken by fitting the stump tightly and so getting circumferential pressure upon it, yet this must not be trusted to any great extent, as by this method the skin is apt to be stretched tightly over the end of the stump, and if the scar is terminal or the skin thin this may result in ulceration.

Following amputation through the thigh the artificial limb is generally suspended by a sling over the shoulders, the lower end of which is attached to the leg below the knee, either directly or by passing over a pulley. In this way it acts as a knee-extending mechanism. In short stumps, however, this is insufficient to enable the stump to remain securely in the bucket and to control the limb; therefore a pelvic band is added. The mechanism used to extend the knee is of two sorts. The older one is by the use of a spring, either of rubber or of steel; it should act in such a way that the knee is only extended by it from the right-angled posi-

tion; if it acts from a position of greater flexion than this it will prevent the man from sitting comfortably with a flexed knee. The second method is by the use of the sling from the shoulders, which pulls upon the front of the leg piece when the shoulders are raised or when the weight of the swinging limb comes upon it, thus extending the knee. The stops which limit the movement of the knee in both directions must be so strong as to be unbreakable even when the whole weight of the body exerts its maximum leverage upon them.

In the present types of legs the movement allowed at the ankle-joint is small in range (only about 20 to 30 degrees), and this movement is stopped by the compression of springs, usually of rubber, but sometimes of steel. The smallness of the range of movement is not found to interfere with walking —in fact, the walk is quite good if there is no movement at all.

Correct building of the limb is important if stability is to be secured. Two points are essential: first, the axis of the knee-joint must be behind the line which represents the center of gravity of the body when it is erect; and secondly, the foot must be mounted in slight equinus (20 degrees), and must be prevented from reaching the right-angled position.

The routine material for the construction of an artificial leg is still willow, and as a rule the thigh and leg pieces are constructed of single pieces of wood, appropriately hollowed out, the joints being made of steel. It is not an advantage to have very lax joints in an artificial leg; as a rule the joints are lined with a bushing of leather, by adjusting which they can be made stiffer.

Hip-joint amputations are fitted with a leather cup, which entirely encloses the stump, fitting it very accurately. It is attached to the trunk by a steel pelvic band; to it is attached the limb by a hinge joint on the outer side, and by a steel piece which runs around on a quadrant situated upon the under surface of the leather cup on the inner side. It is possible, by placing the hip-joint far forward and the knee-joint far back, to fit a limb which is stable with both hip- and knee-joints free; but it is customary to fit locks to both these joints, so that the man may walk with one or other free.

In amputations through the knee the lower end of the stump is larger than the part higher up; therefore the front of the bucket must be cut away and filled in by a lacing piece of leather, or else an entire leather thigh piece must be used. In either case the leg piece is attached by outside steel joints. For amputations below the knee a wooden bucket is accurately fitted to the head of the tibia, and below the patella; the weight should be borne upon these points, although in exceptional cases it may be necessary to fit a leather thigh bucket reaching right up to the tuberosity of the ischium and taking a bearing there.

PLEURISY.

Under this title FINDLEY (*Journal of the Iowa State Medical Society*, Oct. 15, 1917), after discussion of the various types, concludes that the prognosis in pleurisy necessarily depends upon the nature and extent of the infection. Some of the involvements are malignant and partake of the usual habits of their kind in other tissues.

Practically all post-pneumonia empyemas, which is the most common form in children, make a permanent recovery if properly drained.

Serious effusions of the pneumococcal type make an uneventful and rapid recovery after a single aspiration as a rule.

The prognosis in tuberculous serous effusion is regarded as good following aspiration, since the strong defensive power of the serosa may usually be relied upon to clear up the remaining mild infection.

A failure of empyema to clear up after drainage probably means tuberculosis.

Cabot states that he has never known a tuberculous empyema case to get well.

Streptococcus empyema, which is the most common type among adults, is the most serious of all, and free drainage in some instances fails to prevent septicemia.

Streptococcus infection of the pleura may arise in the presence of almost any of the acute infectious diseases, and adds greatly to the gravity of the situation.

Septicemia with secondary infection of the pleura is most rapidly fatal.

In dealing with the non-surgical treatment Parker advises strapping to immobilize the parts, the application of an ice-bag, and the use of morphine or other opiates to quiet respiratory movement. Further, he advises calomel followed by salines, tincture of aconite or tincture of veratrum viride to dilate peripheral vessels.

He states that there is no drug which will hasten the absorption of exudate, but believes that the salicylates in large doses should be used because of their being taken up by the exudate and giving it antiseptic value.

Auto-serotherapy consists of the withdrawal of two mils of the serous fluid, and without withdrawing the syringe, reinjecting the fluid in the subcutaneous tissue. If after two weeks the exudate has not decreased thoracentesis is advised.

As to the surgical treatment, Littig advises for dry and non-tuberculous pleurisy straps applied during the height of expiration, extending half-way round the affected side. Dry tuberculous pleurisy, with a coarse leathery friction murmur, may be benefited by the introduction of 200 Cc. of nitrogen, to be followed by a second introduction of 300 Cc. of nitrogen two days later, and a third 300 Cc. of nitrogen one week after the second.

In simple pleurisy with effusion, the fluid should not be removed unless it cause embarrassment to the patient, or continue for a period longer than several weeks. The presence of pus in the pleural cavity indicates an open operation for its removal, followed by constant drainage.

Moderate suction is advised, Ransohoff's suggestion being warmly commended. This can be improved by cutting the end of a drainage tube on a very long bias, then tying the finger of a rubber glove over the end of the tube, a glass spindle with flanged ends being inserted into the rubber tube in order to make a firm tie. With a small slit in the end of the rubber finger, an excellent one-way valve is formed and fluid readily escapes but air cannot enter.

Not infrequently a thoracic sinus persists. Bismuth paste is of very little value; a case of fatal accident from its use is reported.

RESTORATION OF GASTROINTESTINAL CONTINUITY FOLLOWING PARTIAL GASTRECTOMY FOR CANCER OF THE PYLORIC END OF THE STOMACH.

BALFOUR (*Surgery, Gynecology and Obstetrics,* November, 1917) notes that the methods of gastric resection which have been most successfully used in the Mayo clinic are:

The Billroth No. II operation, which gave decidedly better results than any of the preceding methods. It was employed for some years with much satisfaction. This operation of resection and suture by posterior gastroenterostomy was necessarily varied by circumstances, so that anterior gastroenterostomy and a Murphy-button anastomosis occasionally were indicated and made use of to reëstablish the continuity of the gastrointestinal tract.

About four years ago the so-called Polya operation, which seemed to possess quite obvious advantages over the Billroth No. II in a considerable percentage of cases, was adopted in the clinic. This operation, described by Dr. W. J. Mayo in 1915, while followed by better results than the Billroth No. II, still presented technical difficulties under certain conditions, particularly following extensive gastric resections. In such cases it was sometimes quite impossible to bring the gastric stump with the attached jejunum satisfactorily through and below the level of the opening which had been made in the transverse mesocolon.

During the past few months the following method has been used, a method which has given better results, and which is now

considered the best routine operation for the removal of gastric cancer.

The resection is carried out in the ordinary way, with especial attention to such important points as the wide removal of gland-bearing tissue, the avoiding of injury to the middle colic blood supply of the transverse colon, the resection made well beyond the cancer limits, the cauterization of all cut mucous surfaces to prevent cancer-cell transplantation, and the secure inversion and burial of the duodenal stump. The operative field is inspected and carefully isolated by fresh packs, and the second stage is carried out as follows:

The first loop of jejunum is procured and a point about 14 to 18 inches from the duodenojejunal angle is marked. The jejunum is then carried up in front of the transverse colon and omentum, and a segment of suitable size is chosen at the point already marked. This section of jejunum is lightly grasped with rubber-covered forceps, and directed so that the proximal end of the loop will be approximated to the lesser curvature of the stomach. A series of interrupted silk sutures in the serosa is used for the first line posteriorly, beginning at the greater curvature. All these sutures are placed before any are tied, and the ends of the top and bottom sutures may be conveniently left as guides. The first suture line is about one-half inch below the clamp on the cut end of the stomach, and on the side of the jejunum about three-fourths of an inch from the summit of the loop.

In extensive resections it is extremely important to get the best possible exposure of the lesser curvature, for at this point it is occasionally difficult to make a secure anastomosis, and it is along the lesser curvature that inflammatory products frequently extend, rendering the gastric wall friable and a distinct source of danger. Any measure in such cases which will prevent retraction of the lesser curvature should be utilized. The right-angled rubber-covered clamp is of the greatest service for this purpose. The jejunum is now incised on the line and the crushing clamp removed from the stomach. (If it has been possible at any previous stage in the operation to place without difficulty a straight rubber-covered clamp at a higher level on the stomach, soiling by unevacuated gastric contents will be prevented.) Any actively bleeding vessels are ligated. The posterior row of the anastomosis uniting the posterior wall of the stomach to the inner cut edge of the jejunum is of chromic catgut. The stitches on the gastric side should be taken after the edge which has been crushed by the clamp has been trimmed with the scissors. A second row of finer catgut may be used to advantage in the posterior line. The first chromic catgut suture is continued in front in the usual way to complete the closure. An interrupted silk suture line similar to that used posteriorly is placed anteriorly, particular care being taken to reënforce the angle of anastomosis at the lesser curvature. A few interrupted silk sutures are placed where necessary further to protect the anterior suture line and the suture at the lesser curvature, the stump of gastrohepatic omentum which contains the ligated gastric artery being utilized as a support to the gastrojejunal angle at this point.

The procedure as described is applicable to the majority of cases. When, however, chronic pyloric obstruction has greatly dilated the stomach, the gastric outlet after resection is often much larger than is necessary for the anastomosis. Under such circumstances the outlet may be decreased by partly closing it at the upper angle with sutures, as advised and practiced by Dr. C. H. Mayo, or the outlet may be approximated to a much smaller opening in the jejunum by suitable suturing. Thus, if the gastric outlet is one-third larger than the size of the opening desired in the jejunum, the intervals between all stitches on the gastric side should be one-third greater than those on the jejunal side. The readiness with which the stomach will adjust itself is, of course, largely dependent on the fact that its great size is abnormal and the

stretched-out tissues tend to contract rapidly. However, it has been the author's experience that there is no objection to an anastomosis of considerable size.

The advantages of the anticolic end (gastric) to side (jejunum) method are quite obvious. It can be used in practically every case; it is simpler, safer, and can be accomplished in less time than any other method. The operation may be completed well within the hour, and if conditions for operation are favorable even within half an hour. Its particular advantage is seen in extensive resections, when such a small segment of stomach remains that posterior gastroenterostomy would be difficult. This fact makes it quite possible that not only will the method result in more radical operations in gastric cancer, but by reason of this advantage it will occasionally permit resection in cases heretofore considered inoperable. No disadvantages in the method have been encountered, and it has been the experience of the surgical staff at the clinic that patients in whom this method has been employed are less subject to postoperative complications than are those who have been operated upon by other methods.

That the operation is of less risk than other methods is very definitely shown by the author's operative mortality statistics. From January, 1907, to August 16, 1917, in 318 resections by the Billroth No. II method, there was an operative mortality of 13.2 per cent; in 104 cases by the Polya method, a mortality of 14.4 per cent; while in 38 cases with the method described the mortality was only 5.2 per cent. This comparison of operative mortality is quite fair inasmuch as the operations were done by the same surgeons in the same clinic with similar surgical indications.

REVIEWS.

DISEASES OF THE SKIN. Their Pathology and Treatment. By Milton B. Hartzell, A.M., M.D., LL.D. Illustrated. J. B. Lippincott Company, Philadelphia, 1917. Price $7.00.

Dr. Hartzell has placed before the profession a large manual of 754 pages dealing with dermatology. The book contains fifty-one colored plates and two hundred and forty-two cuts in the text. The plates are remarkably good, as are also the black-and-white illustrations. All of the illustrations seem to be original, and every type of skin disease has its example presented to the reader. The author has been actively practicing dermatology for many years in various public institutions, so that, in addition to his private practice, he has had ample opportunities to become an authority upon his special subject. Needless to say he has not only embodied his own views but also those which are held by the most eminent authorities, both in Germany and in France. A point which is noteworthy is the recognition by Dr. Hartzell that the specialist in dermatology must also be a competent internist, since in this specialty of all others the relationships between internal medicine and diseases of the skin are exceedingly intimate. Although the title of the book would lead one to suppose that pathology and treatment are the dominant subjects considered, etiology and prophylaxis might readily have been contained in the title of the volume, since they occupy their positions of relative importance.

In closing we think it well to emphasize once more the excellent character of the illustrations, which will appeal particularly to the general practitioner, who often finds it difficult to make a diagnosis of skin disease from description in type.

RADIUM THERAPY IN CANCER. By Henry H. Janeway, M.D. Paul N. Hoeber, New York, 1917.

This small book of about two hundred and fifty pages consists in the first report of the use of radium therapy in cancer in the Memorial Hospital, New York, for the years 1915-16, with a discussion of treatment of cancer of the bladder and prostate by this means written by Benjamin S. Bar-

ringer, M.D., and also including an introduction upon the physics of radium by Gioacchino Failla. In connection with the employment of radium in the treatment of carcinoma of the breast, the point is emphasized that in many instances the tumor is deeply situated and the breast is fat and very mobile, which conditions render the application of radium somewhat difficult. The growth, too, is often diffuse. On the other hand, many cases are peculiarly suitable for radium treatment, cases which are the antithesis of those just described—firm, small nodules, well set apart from the rest of the gland—and can, therefore, be readily covered with a radium applicator. The author thinks that if it is justifiable to use radium in early cases of cancer of the breast, and the probability of its success is sufficient to justify its use, it will be in this latter class when, for various reasons, operation is not possible; but he evidently is in accord with the majority of authorities in the belief that operation in the vast majority of cases is the safer procedure. In those unfortunates who are sufficiently ignorant or obstinate to decline operation radium affords at most a temporary and possibly curative method of treatment, which should be tried at least until the patient can be converted to a proper view.

Finally, the author uses these pregnant words: "I would not recommend radium as a primary resort in mammary cancer."

MILITARY OPHTHALMIC SURGERY. By Allen Greenwood, M.D. Including a chapter on Trachoma and Other Contagious Conjunctival Diseases, by George E. de Schweinitz, M.D., and a chapter upon Ocular Malingering, by Walter R. Parker, M.D. Lea & Febiger, Philadelphia, 1918. Price $1.50.

This is War Manual No. 3 authorized by the Secretary of War and published under the supervision of the Surgeon-General and the Council of National Defense. Like the small manual prepared by Dr. Vedder and that by Colonel Goodwin of the British Army, which we have already noticed, it is designed, by reason of its size and flexibility, to be readily carried in the breast pocket of the khaki blouse. It has been compiled with the idea of providing in a condensed form suggestions that may be helpful to medical officers who have to deal with the special ophthalmic problems which arise in the daily routine of active medical army work, especially in the dressing stations and hospitals through the war zone. The surgical methods described have proved their worth in hospitals in the British Army. The book is in no sense a treatise on ophthalmic surgery, and the many plastic operations which will be required for later army and civilian reconstruction work have not been included or described. From the standpoint of the average man the chapter on trachoma by Dr. de Schweinitz will be most frequently referred to, since methods of diagnosis and treatment are clearly described and illustrated as are the important forms of conjunctivitis such as that due to gonorrheal infection. Many army surgeons will also find that the brief chapter upon Malingering by Dr. Parker is most useful.

Of the three volumes which have so far appeared this one bids fair to be read at the front most frequently since that on Sanitation by Dr. Vedder contains matter which will most frequently be referred to at the base.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., Assisted by L. F. Appleman. M.D. Volume 4, December, 1917. Lea & Febiger, Philadelphia, 1917.

The issue of *Progressive Medicine* for December, 1917, consists of articles by five authors and covers the same subjects as were covered in previous issues for this quarter of the year. The opening article, by Dr. Martin E. Rehfuss, of Philadelphia, is upon Diseases of the Digestive Tract and Allied Organs, the Liver, Pancreas and Peritoneum, and is a most excellent summary of the studies and advances made in these departments of medicine during the last twelve months. The article upon Diseases of the Kidneys, which covers twenty-six pages, is by Dr. J. Harold Austin. Dr. Charles W. Bonney contributes, as he did last year, an article of about

seventy-five pages in which he reviews the literature of Genito-urinary Diseases, while the subject of Surgery of the Extremities, Shock, Anesthesia, Infections, Fractures, Dislocations, and Tumors is considered by Dr. Joseph Bloodgood, whose article is peculiarly timely in that he has devoted much space to war surgery and the points which should be generally known by all medical men, more particularly by those who are now in the service of the U. S. Army and Navy. Finally, the volume closes with a therapeutic referendum by Dr. H. R. M. Landis. There are more than four hundred and fifty pages in this volume, and this issue is undoubtedly one of the most useful which has ever appeared.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Original Articles. Edited by H. R. M. Landis, M.D. Volume 4. J. B. Lippincott Company, Philadelphia and London, 1917.

The clinics which are reported in this excellent issue of this quarterly periodical deal largely with surgical procedures, the first 194 pages being devoted to these topics. The next 170 pages deal with subjects which are medical in nature. There is one contribution dealing with Psychiatry, one upon Public Health, in reference to food valuation and war-time considerations. Last of all, there are three communications covering a little over one hundred pages dealing with the Treatment of Pyemia and Septicemia by Transfusion of Immunized Blood, Ether Anesthesia, and one upon the Immobilization of Fractured Limbs in Military Surgery.

THE PRACTICAL MEDICINE SERIES. Edited by Charles L. Mix, A.M., M.D. Volume 8, Pharmacology and Therapeutics, Edited by Bernard Fantus, M.S., M.D. Preventive Medicine, Edited by William A. Evans, M.S., M.D. Series 1917. Year Book Publishers, Chicago. Price $1.50.

The first two hundred and twenty pages of this little volume are taken up by the contribution on Pharmacology and Therapeutics written by Dr. Fantus and the remaining one hundred and twenty-three are consumed by Dr. Evans's article. We are glad to note that an article published in the THERAPEUTIC GAZETTE by Dr. Larned in October, 1916, upon intravenous medication, is not only freely quoted, but the illustrations are reproduced. Dr. Fantus's article forms a useful little summary of therapeutic literature, as does that of Dr. Evans upon Preventive Medicine.

THE PRACTICAL MEDICINE SERIES. Edited by Charles L. Mix, A.M., M.D. Volume 7, Obstetrics. Edited by Joseph B. De Lee, A.M., M.D., with the Collaboration of Eugene Cary, M.S., M.D. Series 1917. The Year Book Publishers, Chicago. Price $1.35.

In a volume containing two hundred and twenty-four pages Dr. DeLee and his collaborators present a summary of recent obstetrical literature with illustrations consisting of charts and microscopic sections, as well as gross pathological lesions, and the use of a special stethoscope and the electric light in the care and treatment of obstetric patients.

IMPOTENCE AND STERILITY, WITH ABERRATIONS OF THE SEXUAL FUNCTION AND SEX-GLAND IMPLANTATION. By G. Frank Lydston, M.D., D.C.L. The Riverton Press, Chicago, 1917.

Covering a subject of perennial interest, this book opens with a chapter upon Aberrant and Undifferentiated Sex, briefly and clearly discussed. Thereafter follow Diseases of the Sexual Function and Instinct; Sexual Perversion and Inversion. Lydston expresses the belief that satyriasis and nymphomania are due to a defective structure or a disturbed function, or both, of the special hormone-producing cells of the testes and ovary. The secretion may be lessened in quantity or vitiated in quality.

Concerning masturbation, the author points out that it is met with in the lower animals. He notes that the serious effects of masturbation are relatively rare, nor are the symptoms of indulgence in this habit in youth by any means clear. Concerning sexual excess, it is stated that poorly developed testes are not usually accompanied with great vigor of mind and body. The author believes that there are few people who are not injured by indulgence in coitus oftener than twice or thrice weekly.

Treatment of Masturbation is briefly but ably discussed. In a very few pages are considered the important subjects of sterilization and asexualization, on which Lydston has pronounced and original views. He holds, for instance, that the healthy husband should never be sterilized to save a degenerate or diseased wife from child-bearing, for, while subsequent anastomosis of the vas is likely to be successful, it cannot be guaranteed, and the capacity for fatherhood under more favorable circumstances possibly might be lost.

Sterility and Impotence, with treatment, are discussed briefly but thoroughly. There follow chapters on Spermatorrhea and Sexual Neurasthenia; a vividly interesting section on Sex Gland Implantation, concerning the potentialities of which the author is an enthusiast.

A book clearly written, showing much thought, and suggesting new lines of investigation and therapeusis.

CORRESPONDENCE.

ACONITE IN TONSILLITIS.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: I notice in the January number of your magazine an article on "Diseases of the Tonsils." If the medical fraternity knew the influence aconite has on the tonsils its diseases would be much less troublesome. I learned this power of aconite over the tonsils accidentally. When called to treat quinsy, a very common disease in Illinois, where I then resided, and finding the tonsils inflamed and largely swollen I used aconite quite freely in their treatment, and soon found I had a very effective remedy for that painful disease—and unless pus had already formed when called to the case, I never had that disagreeable termination of the disease.

Unless I am deceived, your readers will be much benefited by my experience.

Yours truly,

A. J. RODMAN, M.D.

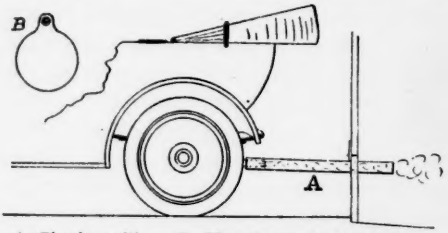
DELAVAN, WISCONSIN.

NOTES AND QUERIES.

POISONOUS GASES IN A CLOSED GARAGE.

In the *Medical Record* of December 22, 1917, WOOD points out that the products of combustion in internal explosion motors, whether it be the carbon monoxide or other poisonous gases which they contain, have long been known to be acutely poisonous, and in certain cases fatal. Where these gases are exhausted into a confined space, such as the pit containing a pumping engine, or a small private garage, there is grave danger, unless precautions are carefully observed, of accidents.

The very general use of motor cars throughout the country has necessitated a great many small and inexpensive places for housing them. These are not usually heated, and it is generally necessary, in freezing weather, to run the engine of a car



A—Pipe in position. B—Pivoted cover for hole in door.

for a longer or shorter time before starting out. Of course, in very cold weather the temptation is to start the engine without opening the doors.

It has occurred to Wood that a very simple and inexpensive device will greatly reduce the danger, if not entirely eliminate it. The plan is to bore through the garage door, at a point about opposite the exhaust pipe of the car when in its usual position, a hole 2 or 3 inches in diameter, closed, when not in use, by a wooden drop-cover on the inside. A piece of light metal piping, of any kind, just large enough to be shoved over the end of the exhaust pipe of the car, is kept in the garage. When the car is to be started this pipe is first pushed out through the hole, and then drawn in and passed over the end of the exhaust pipe.

The diagram illustrates the idea.